SANTA ANA RIVER WATERMASTER

FOR

ORANGE COUNTY WATER DISTRICT Vs. CITY OF CHINO, et al

CASE No. 117628 - COUNTY OF ORANGE

FOURTH

ANNUAL REPORT

OF THE

SANTA ANA RIVER WATERMASTER

1973-74

FEBRUARY 18, 1975

SANTA ANA RIVER WATERMASTER

FOR
ORANGE COUNTY WATER DISTRICT VS. CITY OF CHINO, ET AL
CASE NO. 117628 – COUNTY OF ORANGE

WATERMASTER
MAX BOOKMAN
WILLIAM J. CARROLL
JAMES C. HANSON
JOHN M. TOUPS
ALBERT A. WEBB

MAILING ADDRESS
3788 MC CRAY STREET
RIVERSIDE, CALIFORNIA 92506
TELEPHONE: (714) 686-1070

February 18, 1975

To: Clerk of Superior Court of Orange County
and all Parties

Re: Watermaster Report for 1973-74

Gentlemen:

We have the honor of submitting the fourth annual report of the Santa Ana River Watermaster.

The principal findings of the Watermaster for the water year 1973-74 are as follows:

At Prado

(1)	Base Flow at Prado	43,769 acre-feet
(2)	Annual Weighted TDS of Total Flow	704 ppm
(3)	Annual Adjusted Base Flow	43,769 acre-feet
(4)	Cumulative Adjusted Base Flow	174,118 acre-feet
(5)	Cumulative Entitlement of OCWD at Prado	168,000 acre-feet
(6)	Cumulative Credit (4)-(5)	6,118 acre-feet
(7)	One-third of Cumulative Debit	0 acre-feet
(8)	Minimum Required Base Flow in 1974-75	37,000 acre-feet

At Riverside Narrows

(1)	Base Flow at Riverside Narrows	16,203 acre-feet
(2)	Annual Weighted TDS of Base Flow at Riverside Narrows	700 ppm
(3)	Annual Adjusted Base Flow	16,203 acre-feet
(4)	Cumulative Adjusted Base Flow	66,337 acre-feet
(5)	Cumulative Entitlement of CBMWD and WMWD at Riverside Narrows	61,000 acre-feet
(6)	Cumulative Credit	5,337 acre-feet
(7)	One-third of Cumulative Debit	0 acre-feet
(8)	Minimum Required Base Flow in 1974-75	13,420 acre-feet

The above findings show that at the end of the water year 1973-74 there existed a credit of 6,118 acre-feet in the obligations of Chino Basin Municipal Water District and Western Municipal Water District in the discharge of Base Flow downstream from Prado Dam. During the following water year, 1974-75, the minimum required Base Flow is 37,000 acre-feet. At Riverside Narrows, there existed a credit of 5,337 acre-feet. The obligation of San Bernardino Valley Municipal Water District during the water year 1974-75 is a minimum Base Flow of 13,420 acre-feet.

During the water year 1973-74 Nontributary water was released from the California Aqueduct at Devil Canyon Powerplant to the Rialto Feeder of The Metropolitan Water District. These releases were made at the request of the Orange County Water District. The Nontributary water purchase was for ground water replenishment in Orange County. An appropriate adjustment was made to exclude this Nontributary water in the determination of Base Flow and Adjusted Base Flow at Prado Dam. Similarly an appropriate adjustment was made for that portion of Nontributary water released above Riverside Narrows during water year 1972-73 which reached Prado during the water year 1973-74.

Sincerely yours,

Santa Ana River Watermaster

By: Max Bookman
Max Bookman

William J. Carroll
William J. Carroll

James C. Hanson
James C. Hanson

John M. Toups
John M. Toups

Albert A. Webb
Albert A. Webb

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SANTA ANA RIVER WATERMASTER

Max Bookman
Chairman

Albert A. Webb
Secretary

William J. Carroll

James C. Hanson

John M. Toups

CHAPTER I
INTRODUCTION

On October 1, 1970 as the result of the stipulated Judgment in Case No. 117628, Orange County Water District vs City of Chino, et al, entered on April 17, 1967, a regional allocation of the water supply of the Santa Ana River became effective which established entitlements to the river supply as between the Upper Area in San Bernardino and Riverside Counties, and the Lower Area in Orange County. In addition to a declaration of rights the Judgment also contains provisions for a physical solution to implement the agreement reached. The obligations to maintain the flow of the river at specified annual amounts at Riverside Narrows and Prado are placed on certain parties to the Judgment. The parties named in the Judgment are the four major public water districts within the Santa Ana River Watershed; namely, the San Bernardino Valley Municipal Water District, Western Municipal Water District of Riverside County, Chino Basin Municipal Water District and Orange County Water District.

In order to administer the provisions of the Judgment the Court appointed a Watermaster composed of five persons and required that the Watermaster report annually to the Court and the Parties. During the 1973-74 water year the Santa Ana River Watermaster Committee consisted of Max Bookman, William J. Carroll, James C. Hanson, John M. Toups and Albert A. Webb. Mr. Bookman served as Chairman and Mr. Webb performed the functions of Secretary. This report for the water year 1973-74 is the fourth annual report to be issued since the Judgment became effective.

Scope of Report

Section 7(c) of the Judgment requires the Watermaster to report to the Court and to each party not more than five months after the end of each water year starting with 1970-71. The items to be reported upon are as follows:

(a) Prado Accounting

  (1) Base Flow at Prado

  (2) Annual Weighted TDS of Total Flow at Prado

  (3) Annual Adjusted Base Flow

  (4) Cumulative Adjusted Base Flow

(5) Cumulative Entitlement of OCWD at Prado

(6) Cumulative Credit or Debit

(7) One-third of Cumulative Debit

(8) Minimum Required Base Flow in Following Year

(b) Riverside Narrows Accounting

(1) Base Flow at Riverside Narrows

(2) Annual Weighted TDS of Base Flow at Riverside Narrows

(3) Annual Adjusted Base Flow

(4) Cumulative Adjusted Base Flow

(5) Cumulative Entitlement of CBMWD and WMWD at Riverside Narrows

(6) Cumulative Credit or Debit

(7) One-third of Cumulative Debit

(8) Minimum Required Base Flow in Following Year

The above listed items as determined by the Watermaster for the water year 1973-74, in addition to other data compiled by the Watermaster, are hereinafter set forth. This first chapter is followed by Chapter II, "Prior Year Activities", Chapter III, "Water Supply Conditions", Chapter IV, "Base Flow at Prado", and Chapter V, "Base Flow at Riverside Narrows". As a matter of information, the Appendices of this report contain a brief history of the litigation, a summary of the Judgment, a summary of Nontributary flow and records of water quality below Prado Dam and at Riverside Narrows.

CHAPTER II

PRIOR YEAR ACTIVITIES

While the water supply in the Santa Ana River during the 1973-74 water year decreased as a result of below normal precipitation in the watershed, there was a major increase in the Nontributary water purchased by the Orange County Water District but delivered in the Upper Area and transported through pipelines and natural channels downstream through Prado Dam to the Lower Area.

Four Watermaster meetings were held during 1974. All meetings were held in the offices of the Watermaster in Riverside. Copies of the minutes of the meetings held are available for public inspection in the Watermaster office.

As required by the Judgment the Watermaster prepared the "Third Annual Report of the Santa Ana River Watermaster, 1972-73" which was published under date of February 15, 1974 and copies were submitted to the Court and the Parties. The Watermaster continued the work of collection and analyses of data, maintenance of records and preparation of the 1973-74 annual report. The Watermaster also compiled records and accounts for the Nontributary water from the State Water Project released in the Upper Area at the request of the Orange County Water District. This chapter will describe the Watermaster activities and briefly summarize important related activities of the four major public water districts in the watershed.

Watermaster Service

Stream Flow and Water Quality Measurements

Services to provide the stream flow measurements and water quality data required by the Watermaster were for the most part furnished by the U.S. Geological Survey (USGS). Additional data related to the operation of Prado Reservoir were obtained from the Corps of Engineers and water quality data were supplied to the Watermaster by the State Department of Water Resources, the Riverside and Corona City Sanitation Departments and the Chino Basin Municipal Water District. Data regarding the discharge of Nontributary water into the Santa Ana River were provided by the Metropolitan Water District and the State Department of Water Resources. The financing of the cooperative monitoring program with the USGS was shared by the parties to the Judgment. Such costs are set forth in Table 1.

TABLE 1

COSTS TO THE PARTIES AND USGS FOR MEASUREMENTS WHICH PROVIDE DATA USED BY THE SANTA ANA RIVER WATERMASTER
July 1, 1973 to June 30, 1974

SAN BERNARDINO VALLEY MUNICIPAL WATER DISTRICT		
At Riverside Water Quality Control Plant		
Surface Water Gage	$ 290.00	
Water Quality Monitor	500.00	
TDS Samples	90.00	
At MWD Crossing		
Water Quality Monitor	520.00	
TDS Samples	90.00	
Dozer	83.00	
At Prado Park	312.00	
At Mission Boulevard	240.00	
Analysis, Data Preparation, and Counsel to Santa Ana River Watermaster	600.00	$ 2,725.00
WESTERN MUNICIPAL WATER DISTRICT		
Same as SBVMWD ($1.00 difference due to rounding)	$ 2,726.00	
Temescal Creek Discharge	513.00	
Cucamonga Creek Discharge	513.00	
Chino Creek Discharge	512.00	4,264.00
CHINO BASIN MUNICIPAL WATER DISTRICT		
Same As WMWD ($2.00 difference due to rounding)		4,262.00
ORANGE COUNTY WATER DISTRICT		
At Prado Dam		
Water Quality Monitor, Conductivity Program, and Counsel to Santa Ana River Watermaster	$ 8,080.00	
TDS Determination	800.00	
At Prado Park	624.00	
At Mission Boulevard	480.00	9,984.00
TOTAL FOR PARTIES		$21,325.00
UNITED STATES GEOLOGICAL SURVEY		21,235.00
GRAND TOTAL		$42,470.00

The USGS measured and computed the mean daily discharge of the Santa Ana River at Mission Boulevard, MWD Crossing, Prado Park, and Below Prado Dam as well as the daily discharge of the Riverside Water Quality Control Plant into the Santa Ana River. Discharge measurements were also provided for three smaller streams tributary to Prado Reservoir; Temescal Creek at Corona, Chino Creek at Schaefer Avenue and Cucamonga Creek near Mira Loma.

The U.S. Geological Survey reported that during 1974 the newly constructed low-water control at the gaging station Santa Ana River at MWD Crossing worked well, and provided the data which resulted in an improved record of the discharge. This control has permitted the collection of good data at a normally poor site. The gaging station Temescal Creek at Corona was discontinued on September 30, 1974. This station will have to be relocated if the collection of discharge data is to be continued at this site. Sampling of the Nontributary water in San Antonio Creek commenced on March 28, 1974 for standard cations and anions. As part of this program samples of the water at the Chino Creek gaging station were also taken.

Water quality data are also collected at monitoring stations located at MWD Crossing, Riverside Water Quality Control Plant, and Below Prado Dam.

Compilation and Analysis of Basic Data

The watermaster has established records and procedures for compiling and analyzing the basic data necessary in order to carry out the provisions of the Judgment. These records include the following:

(1) Daily precipitation at San Bernardino County Hospital.

(2) Flow of Santa Ana River at USGS gaging station Below Prado Dam.

(3) Flow of Santa Ana River at USGS gaging station at Prado Park.

(4) Flow of the Santa Ana River at MWD Crossing.

(5) Discharge of Riverside Water Quality Control Plant into the Santa Ana River.

(6) Flow of the Santa Ana River at Mission Boulevard Bridge.

(7) Specific conductance and TDS of the waters of the Santa Ana River Below Prado Dam.

(8) Specific conductance and TDS of the waters of the Santa Ana River at MWD Crossing.

(9) Specific conductance and TDS of the discharge of the Riverside Water Quality Control Plant.

(10) U.S. Army Corps of Engineers Records of Water Storage at Prado Dam.

(11) Flow of Chino Creek at Schaefer Avenue.

(12) Discharge of San Bernardino Water Quality Control Plant into the Santa Ana River.

(13) Flow of Temescal Creek at Corona.

(14) Water Quality Analysis of samples taken at San Antonio Creek and Chino Creek.

(15) Daily evaporation at Riverside Citrus Experimental Station.

(16) Discharge of Nontributary water released at Devil Canyon.

(17) Discharge of Chino Basin MWD Water Quality Control Plant at Chino Creek.

(18) Discharge of Chino Basin MWD Water Quality Control Plant to 30-inch outfall line to Prado Flood Basin.

(19) Discharge of City of Corona Water Quality Control Plant to Temescal Creek.

(20) Daily precipitation at several recording Stations above Prado Dam.

Based on these compiled data, determinations were made of Base Flow, Storm Flow, Nontributary water and relationships between specific conductance and TDS. These determinations are explained in detail in Chapters IV and V.

Administration Costs

In accordance with Paragraph 7(d) of the Judgment, the fees and expenses of each of the members of the Watermaster are to be borne by the district which nominated such member. All other Watermaster administrative costs and expenses are borne by the parties, with OCWD assuming 40 percent of the cost and CBMWD, SBVMWD and WMWD each bearing 20 percent of the cost. The Judgment further provides that the Watermaster may from time to time, in its discretion, require advances of operating capital from the parties.

At its meeting on June 5, 1973 the Watermaster adopted a budget for the fiscal year 1973-74 in the amount of $30,000, of which $17,000 was estimated to be required for additional gaging and monitoring expenses. A special item of $10,000 was added to the budget for the extra engineering and monitoring related to the release of Nontributary water, the cost of which was to be borne by Orange County Water District. Table 2 shows the items and amounts included in said budget.

TABLE 2

SANTA ANA RIVER WATERMASTER BUDGET

	July 1, 1973 to June 30, 1974	July 1, 1974 to June 30, 1975
Administration	$ 3,000.00	$ 2,000.00
Supporting Engineering Services	10,000.00	5,000.00
Reproduction of Annual Report		1,500.00
Additional gaging and monitoring stations, including construction, operation and maintenance	17,000.00	
	$ 30,000.00	$ 8,500.00
ORANGE COUNTY WATER DISTRICT - Extra engineering relative to release of State water	10,000.00	
Total	$ 40,000.00	$ 8,500.00

Table 3 is a statement showing the income and expenses of the Santa Ana River Watermaster for the fiscal year 1973-74. The expenses as shown total $31,836.87, comprised of $7,918.42 of normal operating costs, $12,000 for construction of a weir at the Riverside Narrows gage and $11,918.45 for a special investigation of Nontributary water.

Related Activities of Other Agencies

San Bernardino Valley Municipal Water District

State Project water has continued to flow into the spreading basins in the Upper Santa Ana River from the San Bernardino Valley Municipal Water District's Master Distribution System. Three turnouts in Phase I, Devil Canyon to Waterman Canyon, have been used in this initial delivery; Phase II, Waterman Canyon to Santa Ana River, is now under construction.

Phase II will add an additional 60,000 feet of 78-inch diameter pipeline with turnouts at strategic locations for spreading into existing stream beds and spreading grounds as well as delivery capability to customers who wish to take raw water directly from the pipeline. Additional facilities for future connections are part of Phase II and located in cooperation with other agencies in the San Bernardino Valley.

TABLE 3

INCOME AND EXPENSES
July 1, 1973 - June 30, 1974

INCOME		
Balance June 30, 1973		$14,651.31
Payments by Parties for Fiscal 1973-74		
Chino Basin Municipal Water District	$ 4,000.00	
Orange County Water District	8,000.00	
San Bernardino Valley Municipal Water District	4,000.00	
Western Municipal Water District	4,000.00	
Orange County Water District (Special Assessment - Nontributary Water Investigation and Report)	11,918.45	31,918.45
Total Balance June 30, 1973 plus Income Fiscal 1973-74		$46,569.76
EXPENSE		
Secretary - Office Expense	$ 1,385.48	
Bookman-Edmonston Engineering, Inc. Preparation of 1972-73 Annual Report, including graphs and diagrams	1,038.05	
James C. Hanson Preparation of Prado hydrograph; work on Annual Report; work on MWD Crossing control plans, including meetings with contractor, inspection of construction, and meetings with USGS	953.15	
Albert A. Webb Associates Preparation of data from U.S. Corps of Engineers for Prado Reservoir surface charts; work on Annual Report; preparation of Riverside Narrows hydrograph	3,426.27	
Albert A. Webb Associates Nontributary Water Investigation and Report	11,918.45	
James M. Montgomery, Consulting Engineers, Inc. Printing of 1972-73 Annual Report	1,115.47	
E. L. Yeager Construction Company, Inc. Weir construction at MWD Crossing	12,000.00	31,836.87
Balance June 30, 1974		$14,732.89

Part of San Bernardino Valley Municipal Water District's distribution system for State Project water showing spreading basins and the proximity of the new pipeline. (SBVMWD Photo 4134)

Construction of Phase II is approximately 35% complete. Major flood channel crossings were completed prior to the winter season. Spreading grounds and areas affected by construction have been restored so runoff can be controlled with minimum interference and erosion.

To aid in basin management, the District has begun to assemble a hydrologic computer data base. This data base contains current and historic well measurements, water quality data, amounts of precipitation, production, stream flows, amounts of import and export. Input to the data base is basically from two sources: (1) local agencies who voluntarily contribute data and (2) District operated monitoring programs. At present, the District monitors surface and ground water for changes in water quality at 45 locations. In addition, District personnel measure 80 wells on a monthly basis. In 1974 the Western and San Bernardino Valley Municipal Water Districts through the Western-San Bernardino Watermaster established a rain gage network to monitor the precipitation in the Bunker Hill-San Timoteo Basins. Hydrologic data input to the data base is retrieved for utilization in the various District reports published throughout the year.

Western Municipal Water District of Riverside County

During 1974, the Western Municipal Water District of Riverside County, acting as the regional agency for Jurupa Community Services District, Rubidoux Community Services District, and the City of Riverside, in order to comply with the California Regional Water Quality Control Board's orders for additional treatment of wastes (tertiary treatment) for the area, held a General Obligation bond election in November, receiving 53.9 percent of the vote. This was short of the necessary two-thirds vote. Meetings were held following the election, and new proposals by the three agencies were submitted to the California Regional Water Quality Control Board.

Western Municipal Water District of Riverside County became a full member of the Santa Ana Watershed Project Authority the latter part of the year.

The Metropolitan Water District of Southern California completed, during the year, its Environmental Impact Reports and public hearing on the Riverside Filtration Plant and the Box Springs Feeder. This latter project will provide the capability of blending State Project Water and Colorado River Water in the Lower Feeder. The MWD Board authorized the construction of these facilities, with the Box Springs Feeder to be operational in the early part of 1977.

Chino Basin Municipal Water District

The activities of CBMWD have been quite varied this year, with most of the attention being directed toward the solution of the wastewater problems prevalent in the District.

In the middle of July of 1974 the Cucamonga Interceptor was completed and connected to the CBMWD Regional Plant No. 1, with the result that an additional one to two million gallons per day of treated effluent is now being discharged to the Santa Ana River. Also grant funding was secured for the Montclair Interceptor, which when completed will deliver approximately 1.5 mgd of wastewater, now going to Los Angeles County, to Plant No. 1 and, hence, to the Santa Ana River.

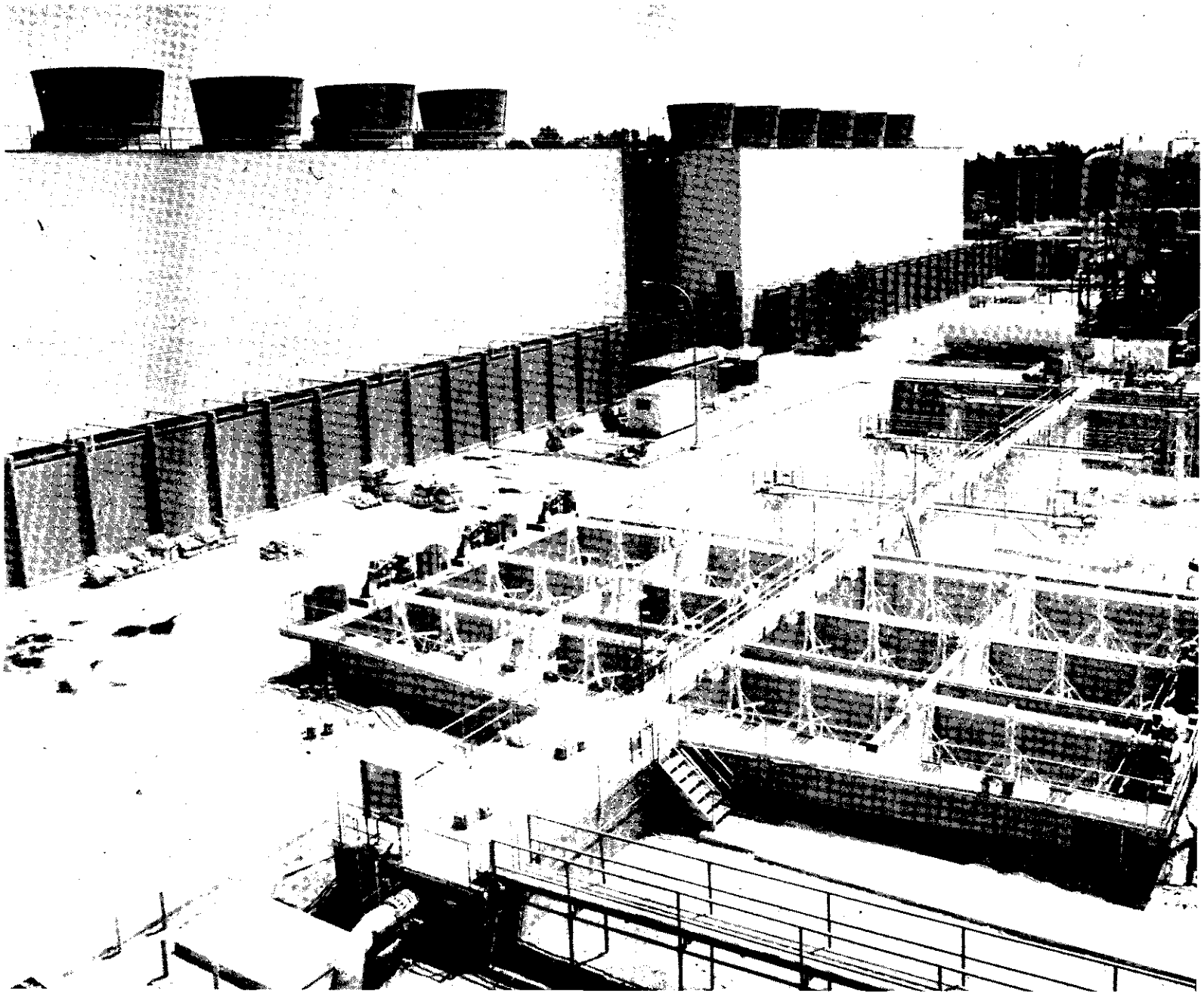
Regional Plant No. 2 (previously City of Chino plant) also is being studied and the design of additions and improvements has been authorized. The improvement will consist of enlarging the plant to an average capacity of 5 mgd and modifying the process to accomplish complete nitrification and partial denitrification. A tertiary plant will also be designed and constructed at this site. A pilot plant study for the use of ozone as a disinfectant and a substitute for chemical coagulation and sedimentation prior to filtration is now being conducted at this site.

Two items involving water management were worked on during the year but were not completed. One is an amendment to CBMWD's authorization act to permit a pump tax on ground water. It is expected that this will be considered by the State Legislature early in 1975. The second is a ground water adjudication of the Chino Basin. A complaint was filed in the Superior Court of the State of California, County of San Bernardino, on January 2, 1975. This complaint asked for adjudication of water rights, for injunctive relief and for physical solution. The plaintiff is CBMWD, with the defendants being six cities, nine public districts, the State of California, 44 water companies, 169 business entities, 1,624 individuals and 2,000 John Does. It is expected that the adjudication procedure will be essentially a friendly one, with the end result serving as a basis for more complete management of the water resource system of the Chino Basin area.

Orange County Water District

The Orange County Water District continued their efforts to supplement the natural replenishment and to protect the groundwater supplies of Orange County.

Water Factory 21, the District wastewater reclamation--sea water desalting plant was under construction. At the end of the water year, the desalter was approximately 97% complete and the wastewater reclamation plant was approximately 98% complete. The well injection system was



Water Factory 21

completed in the prior water year. The water from the two processes will be blended and supplied to the coastal barrier project in the Huntington Beach-Fountain Valley area to prevent further sea water intrusion and provide a supplemental water supply.

The District has initiated the design of two projects which will become components of Water Factory 21 and will provide an interim, additional freshwater supply. The projects consist of the design of three deep wells, with a total design capacity of 6 mgd, and the design of a membrane demineralizer, which will demineralize a portion of the product water from the reclamation plant.

The District continued its water conservation operations at Anaheim Lake and the spreading areas within and adjacent to the Santa Ana River. During the past year, 49,478 acre-feet of imported Colorado River water were released for spreading at Anaheim Lake and adjacent spreading facilities. During the same period, 65,078 acre-feet of imported State Water Project water were released above Prado Dam for conveyance to spreading facilities in Orange County.

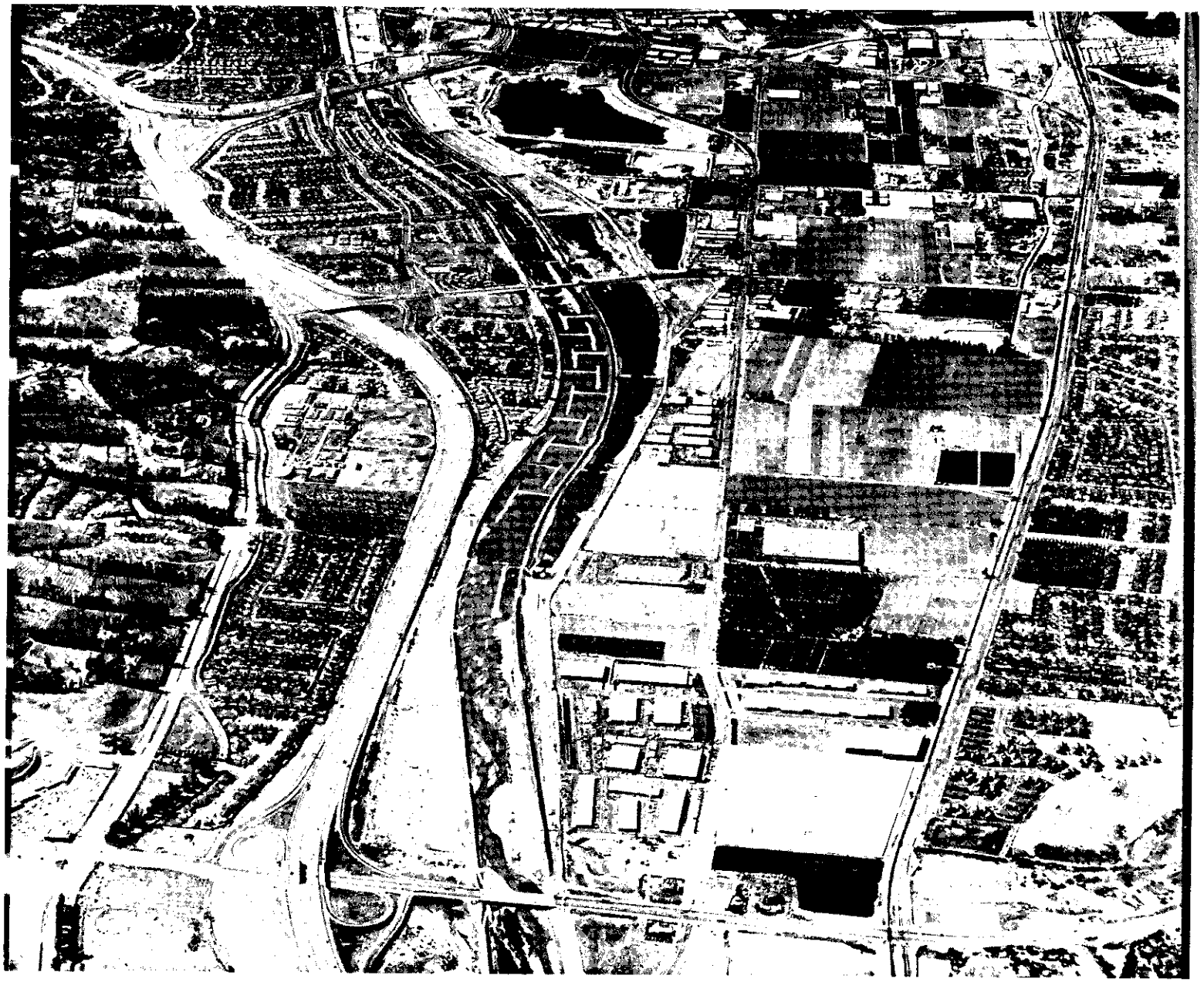
Water conservation facilities adjacent to the Santa Ana River between Imperial Highway and Lakeview Avenue were improved during the water year. Three concrete overflow weirs, a Parshall Flume, protective housing, and other miscellaneous improvements were constructed. This area will be utilized for desilting and spreading flows diverted from the Santa Ana River.

In cooperation with USGS, flow measurement stations have been established at the Parshall Flume and at a location within the Santa Ana River downstream of the structure which diverts flows to the Parshall Flume.

Subsequent to the water quality management study by the Santa Ana Watershed Planning Agency, the District initiated a study to update its master plan for spreading grounds. The objective of the master plan is to conserve the optimum amounts of the large quantities of water which will be available in the future for groundwater replenishment.

To gain greater flexibilities in the operations of the spreading grounds, the District began construction of a 66-inch pipeline between the Santa Ana River and Anaheim Lake. The design of an outlet structure at Anaheim Lake was also initiated in order to spread State water at Orange County Flood Control District facilities downstream of Anaheim Lake.

The District continued studies of pilot desalting facilities to demineralize the effluent from the proposed Anaheim Watewater Reclamation Plant to be built by the District and County Sanitation Districts of Orange County. The potential project will develop greater utilization of present supplies and improve groundwater quality.



Spreading basins in Santa Ana River in
Orange County

Santa Ana Watershed Planning Agency and
Santa Ana Watershed Project Authority

Previous annual reports of the Watermaster have described the establishment and progress of the Santa Ana Watershed Planning Agency (SAWPA), a joint powers entity, formed by the Chino Basin Municipal Water District, Orange County Water District, San Bernardino Valley Municipal Water District and Western Municipal Water District. The purpose for the Planning Agency, stated in 1967, was the development of a comprehensive water quality management plan for the Santa Ana River Watershed. Plan development encompassed all known planning by local entities, cognizance of the Stipulated Judgment and the Watermaster role in the Watershed, and anticipation of both Regional and State activities with respect to local and imported waters, from both the State Project and the Colorado River systems. A key element in the plan is to increase the use of high quality State Project water and to decrease the use of Colorado River water.

In April, 1974, SAWPA delivered to the Environmental Protection Agency, Region IX, the 3-C report which represented completion of a federal clean water planning grant. These funds were matched by local funds from the four member agencies. The 3-C report was followed in late September of 1974 by delivery of a Water Quality Control Plan to the State and Regional Water Quality Control Boards. When finalized and adopted, this latter plan will take the place of the Interim Plan administered by the Regional Board and will set new water quality objectives on many waters within the Santa Ana Basin. Changes in the Santa Ana Watershed include mineral quality objectives for surface flow near Prado Dam and for groundwater subbasins in the Upper and Lower Watersheds. The San Jacinto Watershed will have beneficial use definition and water quality objectives for specific surface and underground waters for the first time as a result of the Water Quality Control Plan.

To date, the cost of development of these plans has been approximately $1,250,000. Of this, about $610,000 has been provided by federal and state clean water agencies, with the remaining $640,000 being provided by the local participating districts.

The Planning Agency has been succeeded in interest by the Santa Ana Watershed Project Authority, with the four major water districts as members. These four districts are continuing their efforts for comprehensive and coordinated management of water quantity and quality within the Santa Ana River Watershed.

As evidence of this coordinated effort, the parties have under construction, in cooperation with the County Sanitation Districts of Orange County, the Santa Ana Regional Interceptor. This $25 million salinity control pipeline represents the key salt removal element envisioned by the planning efforts.

CHAPTER III

WATER SUPPLY CONDITIONS

The 1973-74 precipitation in the watershed was below normal which adds to the large deficiency in water supply experienced during the last five years since the unusually high precipitation experienced in 1968-69. Accordingly, the total flow in the Santa Ana River during the water year 1973-74 decreased. In addition to the decrease in Storm Flow at Prado, the Base Flow also decreased. This decrease in Base Flow was partly offset by the increased discharge of treated wastewater into Prado Reservoir from the Ontario-Upland Treatment Plant in the Chino Basin.

Precipitation During 1973-74

During the 1973-74 water year the precipitation at the San Bernardino County Hospital amounted to 12.72 inches, which is 71 percent of the Base Period average. Most of the precipitation occurred during the months of January and March with monthly amounts of 6.88 inches and 3.00 inches respectively.

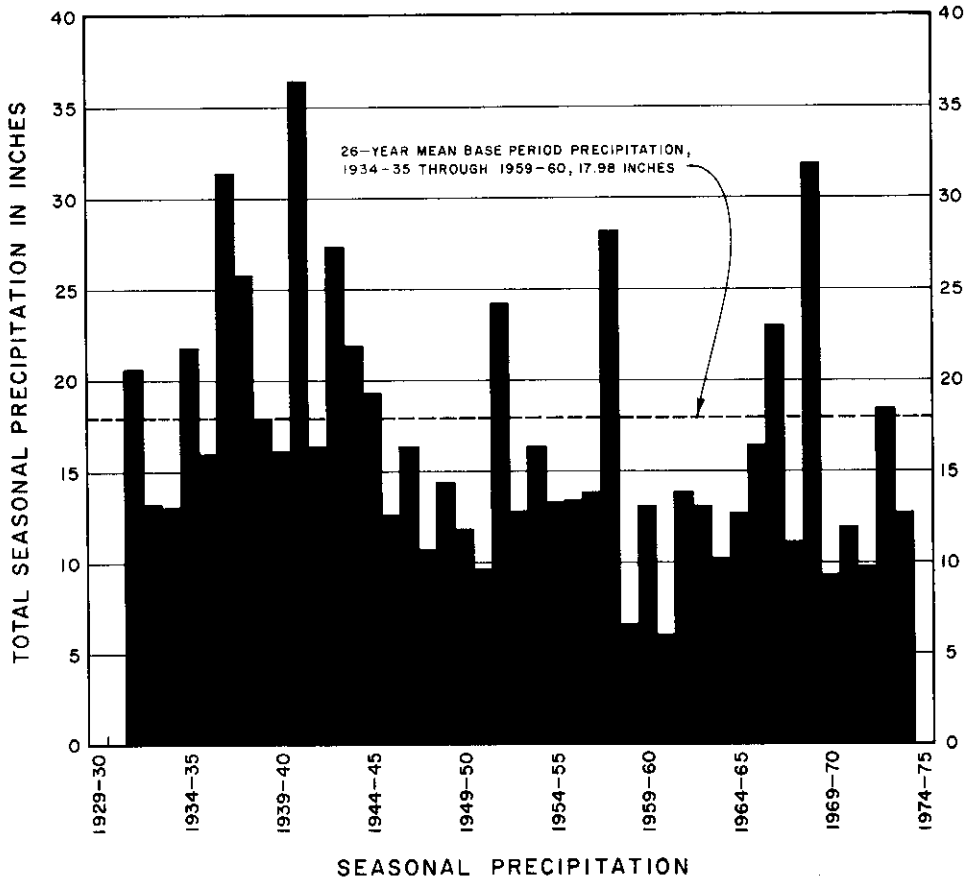
Figure 1 shows the seasonal precipitation from 1931-32 through 1973-74 and the accumulated departure from the 1934-35 through 1959-60 Base Period average.

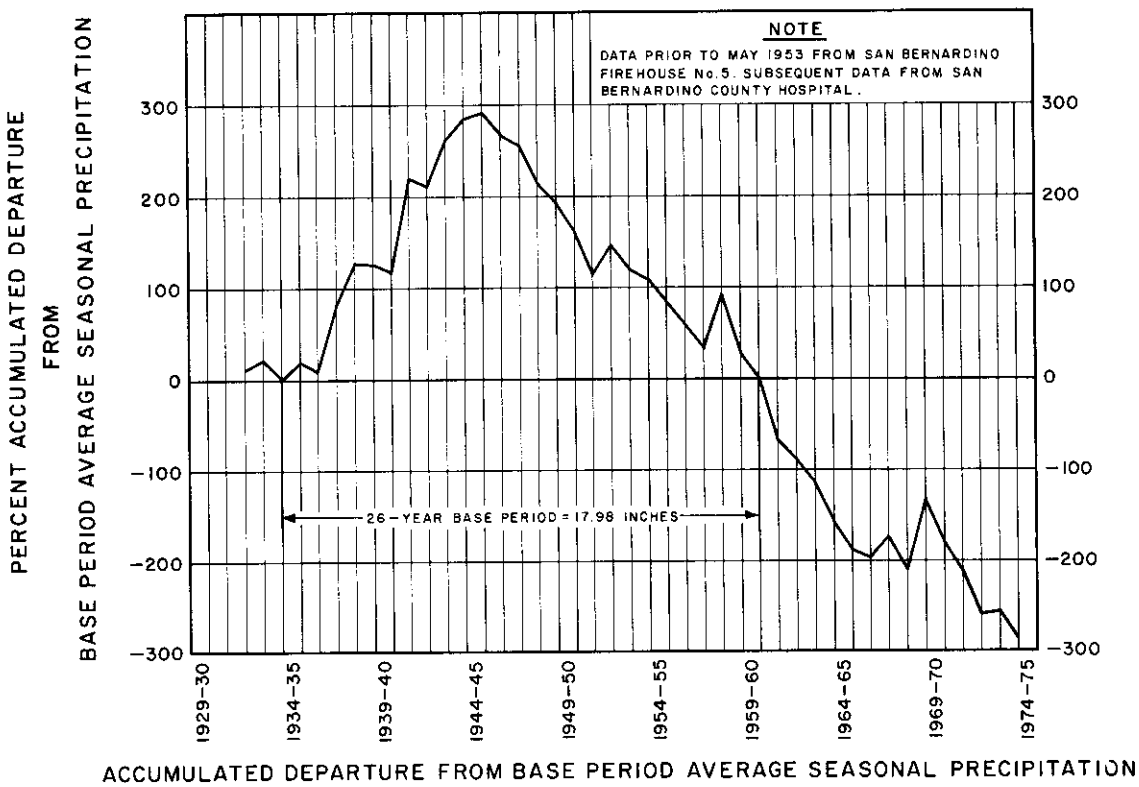
Runoff During 1973-74

Below Prado Dam

The total flow of the Santa Ana River at Prado Dam, less Nontributary water, during 1973-74 was 63,312 acre-feet, which is below the 26-year Base Period (1934-35 through 1959-60) average of 78,780 acre-feet per year. This compares to the flow during the prior year of 77,484 acre-feet when a greater amount of precipitation occurred.

The Base Flow at Prado Dam decreased progressively during the extended drought period and reached a low in 1960-61 of 26,190 acre-feet. Since that year, the Base Flow has generally increased. During 1969-70 the Base Flow amounted to 39,075 acre-feet. The below normal rainfall of the 1970-71 water year was evidenced by a decline in the Base Flow to 38,402 acre-feet; however, during 1971-72 it had again risen to 40,416 acre-feet. During 1972-73 the Base Flow increased to 48,999 acre-feet as compared to the 26-year Base Period average of 47,470 acre-feet. However, during the current year 1973-74 the Base Flow dropped to 43,769 acre-feet.





VARIATION IN PRECIPITATION AT SAN BERNARDINO

FEBRUARY 1975

FIGURE 1

Figure 2 shows the Storm and Base Flow components of the Total Flow in the Santa Ana River below Prado Dam.

At Riverside Narrows

The total natural flow (excluding City of Riverside's sewage effluent and State Project water) at Riverside Narrows for the 1973-74 water year was again below the 26-year Base Period average, amounting to 24,494 acre-feet as compared to the Base Period annual average of 44,650 acre-feet.

The Base Flow at Riverside Narrows decreased from 27,120 acre-feet in 1943-44 to 16,410 acre-feet in 1954-55, increased to 19,470 acre-feet in 1957-58, then decreased to an all-time low of 13,450 acre-feet in 1965-66. Since that time the Base Flow at Riverside Narrows gradually increased to 17,223 acre-feet in 1969-70. The Base Flow at Riverside Narrows decreased to 17,061 acre-feet in 1970-71, to 16,157 acre-feet in 1971-72, increased to 17,105 acre-feet in 1972-73 and decreased to 16,203 acre-feet in 1973-74. This amount compares to the 26-year Base Period annual average of 22,190 acre-feet.

Figure 3 shows the components of natural flow in the Santa Ana River at Riverside Narrows and the sewage effluent from the Riverside Water Quality Control Plant for the period from 1934-35 through 1973-74.

Sewage Effluent from Riverside Water Quality Control Plants

Since the late 1940's the sewage effluent from the Riverside Water Quality Control Plants, which is discharged at the Riverside Narrows between Pedley Bridge and the MWD Crossing, has been increasing in amount. In 1949-50, the amount of treated effluent from Riverside No. 1 and No. 2 plants was 3,960 acre-feet. By 1959-60, the discharge from these plants had increased to 9,900 acre-feet. By 1969-70, the discharge of sewage effluent from the combined treatment plants was 18,657 acre-feet. Thus the contribution of wastwater flow effluent by the City of Riverside has been increasing at a rate of about 800 acre-feet per year. This trend is illustrated on Figure 3. The wastewater flow discharge of the Riverside Water Quality Control Plants during 1973-74 was 19,561 acre-feet. The total for the wastewater flow and the total natural flow of 24,494 acre-feet amounts to 44,055 acre-feet.

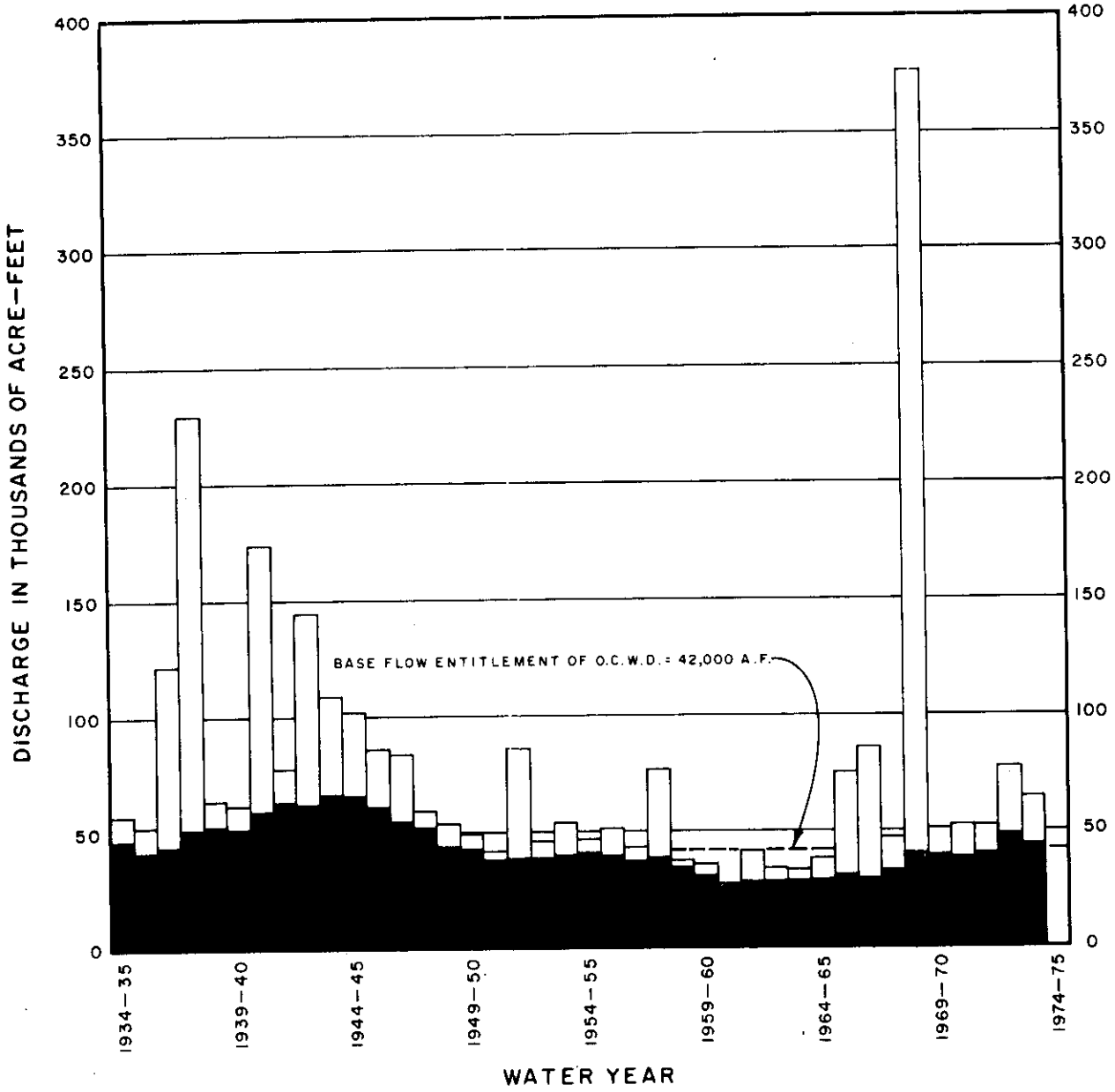
NOTE

DISCHARGE EXCLUDES IMPORTED M.W.D. COLORADO RIVER OR STATE WATER PROJECT WATER BEING TRANSPORTED IN THE SANTA ANA RIVER.

LEGEND

STORM FLOW

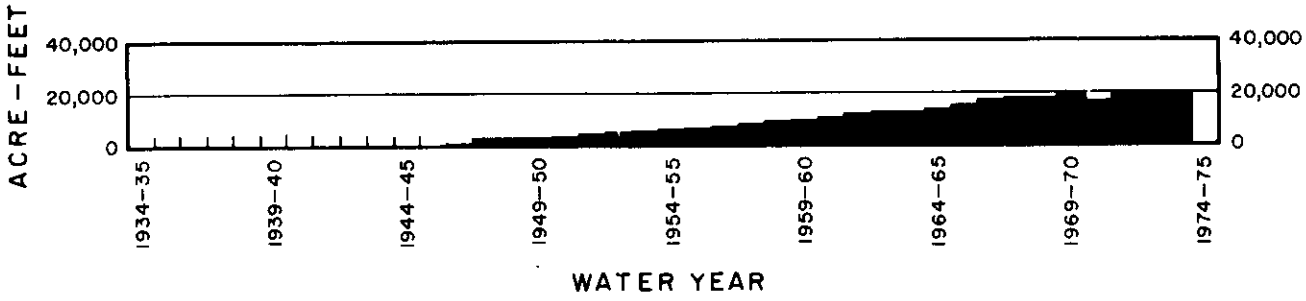
BASE FLOW



DISCHARGE OF SANTA ANA RIVER BELOW PRADO DAM

FEBRUARY 1975

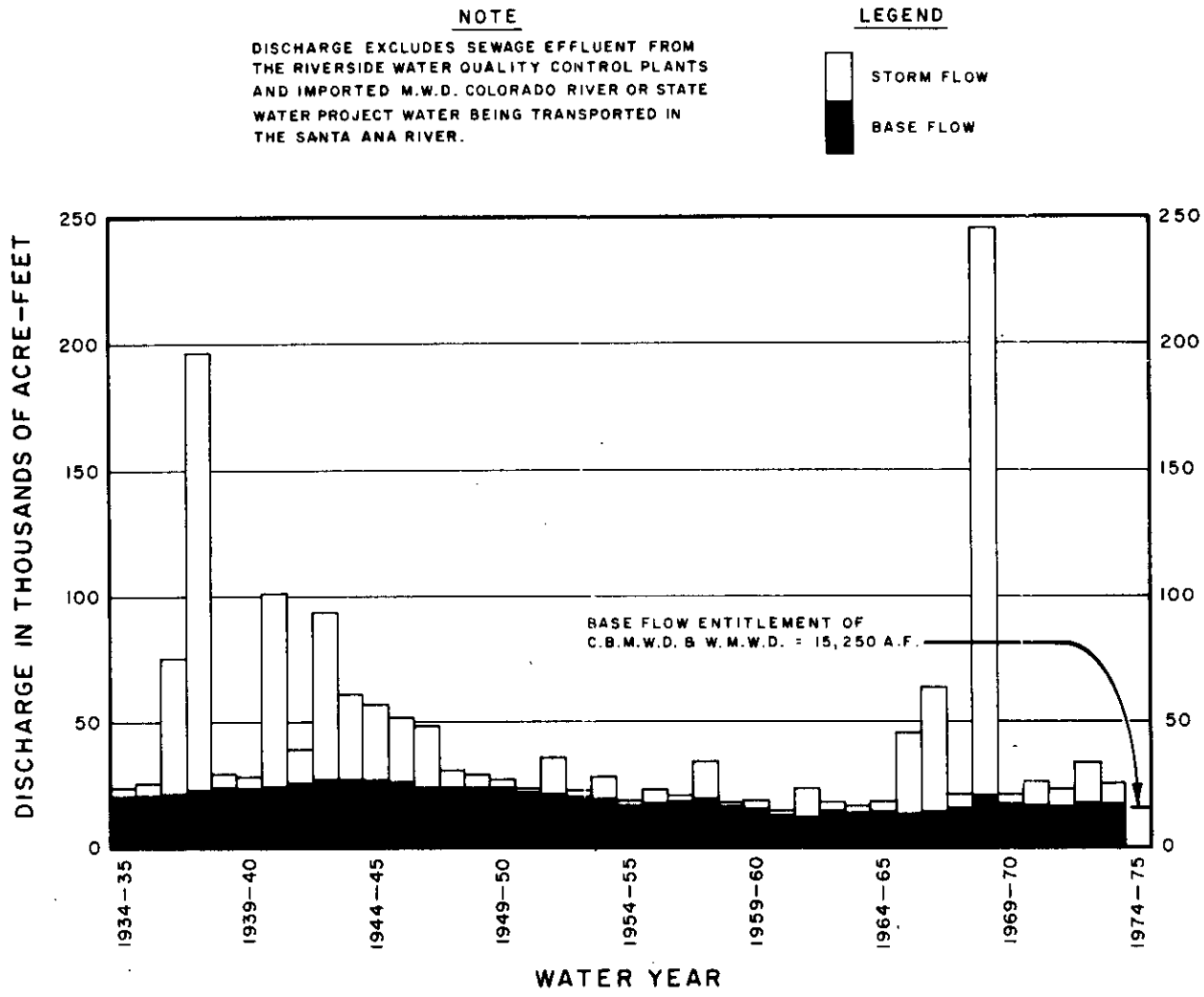
FIGURE 2



SEWAGE EFFLUENT FROM RIVERSIDE WATER QUALITY CONTROL PLANTS

NOTE

DISCHARGE EXCLUDES SEWAGE EFFLUENT FROM THE RIVERSIDE WATER QUALITY CONTROL PLANTS AND IMPORTED M.W.D. COLORADO RIVER OR STATE WATER PROJECT WATER BEING TRANSPORTED IN THE SANTA ANA RIVER.



DISCHARGE OF SANTA ANA RIVER AT RIVERSIDE NARROWS

FEBRUARY 1975

FIGURE 3

Effluent from Ontario-Upland Wastewaster Treatment Plant

In late December 1971 and continuing to date, wastewater effluent from the recently constructed tertiary plant serving Ontario and Upland has been discharged through a 30-inch pipeline and ditch to Prado Reservoir. The quantity of effluent during the water year 1973-74 amounted to about 11,435 acre-feet.

Source of Water Supply at Prado Dam

Prior to the regional allocation of water accomplished under the Judgment, the flow in the Santa Ana River reaching Prado Dam originated as a result of storm runoff and rising water. Using the Base Period 1934-35 through 1959-60 for negotiating purposes, agreement between the parties to the Judgment determined that the Base Flow entitlement of Orange County Water District, in the future, should average 42,000 acre-feet. As stated, historically the Base Flow was comprised of rising water; however, under the Judgment, Base Flow is defined as that portion of the total surface flow passing a point of measurement which remains after deduction of storm flow. As discussed herein, in more recent years treated wastewater has been discharged to the River from a number of wastewater treatment plants. It is interesting to note that during the water year 1973-74 the discharge to the River from the Riverside Quality Control Plants, the Ontario-Upland Sewage Plant, and the Corona Sewage Treatment Plant total 34,503 acre-feet. The total amount of Base Flow at Prado Dam during this year amounted to 43,769 acre-feet.

CHAPTER IV
BASE FLOW AT PRADO

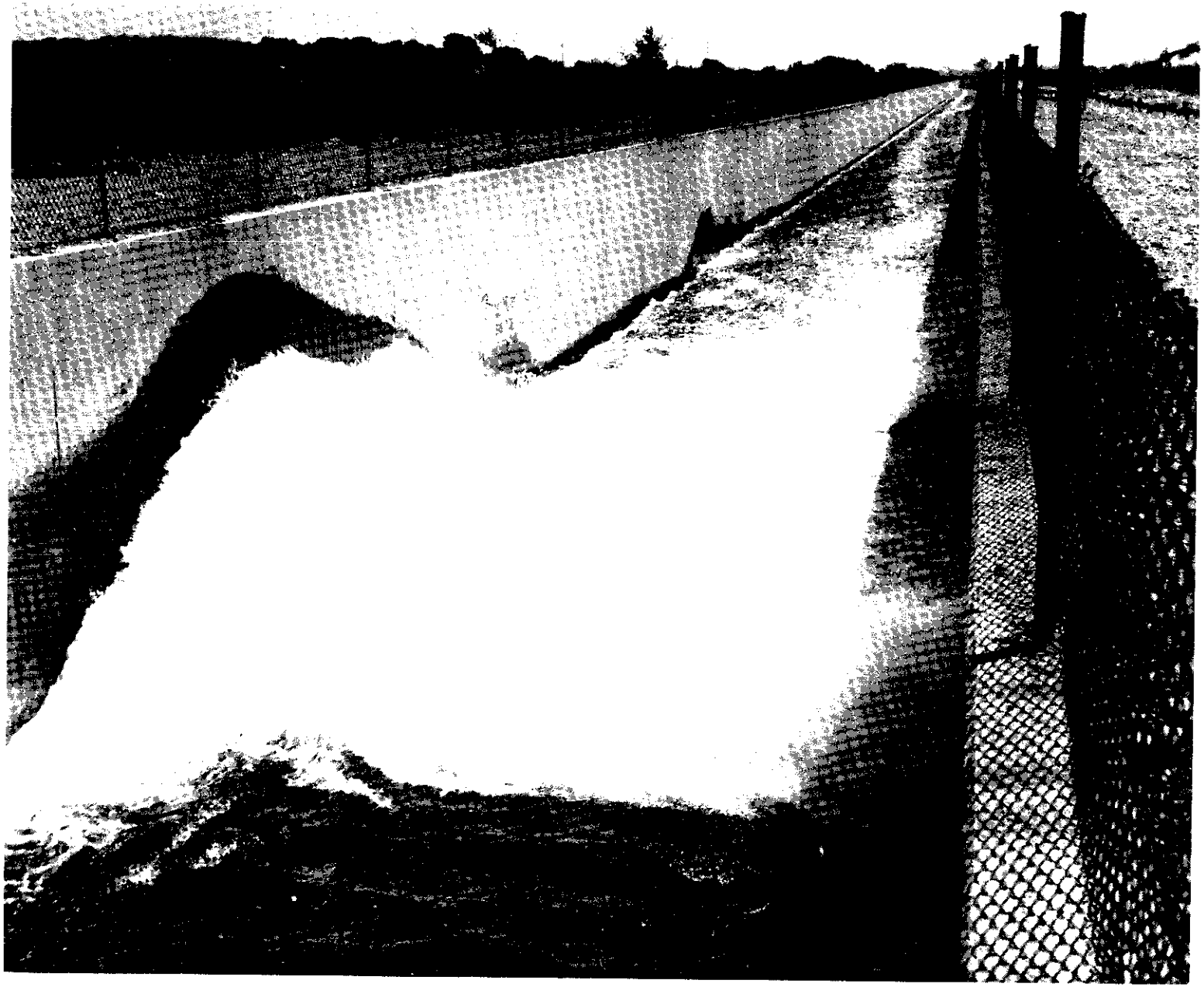
This chapter deals with the analysis of the flow at Prado Dam, the calculation of the amount of Base Flow at Prado credited to CBMWD and WMWD, and the calculation of the Adjusted Base Flow. The adjustment of Base Flow is made on the basis of the weighted average annual TDS of the total flow at Prado less any Nontributary water.

Total Discharge at Prado

The total discharge of the Santa Ana River at Prado during 1973-74 water year amounted to 128,436 acre-feet, as measured at the USGS gaging station below Prado Dam. This amount includes the State water released into San Antonio Creek during 1973-74 and additional rising water from the Riverside groundwater basin due to the release of State water into Santa Ana River during 1972-73. The members of the Watermaster agreed to adjust this amount to 127,327 acre-feet in order to subtract the 1,109 acre-feet of water which were in storage on September 30, 1973, but credited as Base Flow in 1972-73. Because of the large quantities of State water, the total discharge at Prado cannot be compared to the 26-year average annual flow of 78,780 acre-feet during the Base Period of 1934-35 through 1959-60 as in previous years. During the water year 1973-74, a minimum monthly discharge of 4,548 acre-feet occurred in October and a maximum monthly discharge of 22,082 acre-feet occurred in January.

Components of Flow

Of the total discharge at Prado during the 1973-74 water year, 43,769 acre-feet were Base Flow, 19,543 acre-feet were Storm Flow, 980 acre-feet were Nontributary flow due to the release of State Water Project water into the Santa Ana River in 1972-73, and 63,035 acre-feet were Nontributary flow due to State water released into San Antonio Creek. The components of flow were independently determined by each of the five members of the Watermaster using the general procedure set forth in the Work Papers of the engineers for the parties in reaching the physical solution provided for in the Judgment. The Base Flow of 43,769 acre-feet represents an average value of the computations submitted by the five members of the Watermaster. Details of the scalping procedure are described in the following section and the results are graphically shown on



Delivery of State Project Water into San Antonio Wash
in Montclair (Connection OC 59-T)

Plate 2. The components of flow of the Santa Ana River at Prado Dam for each month in the 1973-74 water year are listed in Table 4.

TABLE 4

COMPONENTS OF FLOW AT PRADO DAM
FOR WATER YEAR 1973-74
(Acre-Feet)

Month	USGS Measured Outflow	Change in Storage	Computed Inflow	Storm Flow	Base Flow	Nontributary Water	
						San Antonio Creek*	Riverside Narrows**
Oct 73	4,548	-1,109	3,439	0	3,358	0	81
Nov	5,070		5,070	1,196	3,793	0	81
Dec	11,530	+ 1	11,531	87	4,551	6,812	81
Jan 74	21,884	+ 208	22,092	13,892	5,427	2,692	81
Feb	12,468	- 200	12,268	97	4,923	7,166	82
Mar	11,088	- 9	11,079	3,543	5,809	1,645	82
Apr	7,861	- 1	7,860	393	4,306	3,079	82
May	9,291	+ 3	9,294	335	3,820	5,057	82
June	10,372		10,372	0	2,755	7,535	82
July	12,577	+ 6	12,583	0	1,446	11,055	82
Aug	13,539	- 4	13,535	0	1,677	11,776	82
Sep	8,208	- 4	8,204	0	1,904	6,218	82
Totals	128,436	-1,109	127,327	19,543	43,769	63,035	980

*State water released into San Antonio Creek through Devil Canyon during 1973-74, including adjustments for conveyance losses.

**That portion of State water released during water year 1972-73 upstream of Riverside Narrows, assumed to have reached Prado Dam in 1973-74.

Operation of Prado Dam and Reservoir

During the 1973-74 water year, water was stored behind Prado Dam during the periods October 1 to October 6; November 18 to November 28; December 5 to December 14; January 4 to January 19; January 28 to January 31; February 5 to February 7; March 2 to March 30; and April 1 to April 3. During these periods, the water stored in Prado Reservoir varied up to a maximum of 4,875 acre-feet and the maximum mean daily flow released to the Santa Ana River was 1,420 cfs.

Generally during storms, the Corps of Engineers operated the Prado gates so that some of the storm runoff was temporarily held in storage behind the dam. As the storm ended, Prado Reservoir

storage was gradually reduced by the controlled releases to the downstream water conservation facilities operated by Orange County Water District. The Prado gates were closed on September 17, 1973 and remained closed until October 1, 1973 in order to make repairs downstream of the dam. The 1,109 acre-feet in storage on September 30, 1973 was considered to be Base Flow during that year; therefore, this amount is subtracted from the 1973-74 Base Flow.

Base Flow

Unlike previous years, the determination of the Base Flow curve was complicated by the significant quantities of State water which was released upstream of Prado Dam during 1972-73 and 1973-74. As in previous years, the release of stored Storm Flow over extended periods also masked the magnitude of the Base Flow during non-storm periods.

The general procedure used by the members of the Watermaster to separate the 1973-74 flow components is outlined below:

(1) The daily records at Prado Dam, as measured by the USGS, were plotted for the entire water year as shown on Plate 2.

(2) To facilitate the separation of the Storm Flow component from the Base Flow component, the daily inflow to Prado Reservoir was estimated. This was done by using reservoir stage records secured from the Corps of Engineers and the daily outflows as measured by the USGS. Daily reservoir water surface elevations were converted to acre-feet of storage by use of Corps of Engineers' relationships between the water surface elevation and the storage capacity. Daily reservoir inflow was computed by use of the equation: Inflow = Outflow + Change in Reservoir Storage.

(3) The daily flow component due to the release of State water into San Antonio Creek during 1973-74 was estimated and subtracted from the daily inflows as determined in Item (2) above.

The Watermaster identified probable losses of State water due to seepage in the Rialto Feeder and the seepage and evapo-transpiration losses in the lined and unlined channels and in Prado Reservoir.

The estimated delivery of State Project water was based on State of California, Department of Water Resources' weekly meter charts and daily meter readings of the Nontributary water released at Devil Canyon. Travel time delays for the several reaches between Devil Canyon and

Prado were estimated. These estimates of delays, which are to be restudied, affect the shape and positioning of the Base Flow curve.

After independently examining these factors, the Watermaster agreed to use a loss of 3.14% of the amount of water released. They also agreed to make subsequent investigations to better define the losses associated with these State Project water releases and to make adjustments in the 1973-74 State Project water flow at Prado, if future investigations indicate that the actual losses are materially different from those used in the 1973-74 computations.

These losses were distributed in accordance with the above stated procedure on a daily basis. The resultant Nontributary water reaching Prado amounted to 63,035 acre-feet. The estimated daily inflows to Prado reduced by the amount of said Nontributary flow were plotted for the entire water year as shown on Plate 2.

(4) The daily precipitation recorded at the San Bernardino County Hospital is shown on Plate 2.

(5) Using the above data, an initial determination was made of those days having no Storm Flow component when there were no sharp peaks in the hydrograph. Non-storm periods exclude the time from commencement of rainfall until the end of the recession flow following each storm period. Use was made of the inflow hydrograph to determine Base Flow when discharge of stored water occurred during non-storm periods. All adjacent non-storm days were fitted with smooth curve segments to average out the day-to-day fluctuations.

(6) Utilizing the above curve segments during non-storm periods, a continuous smooth Base Flow curve was drawn and extended across the balance of the time when storms occurred. The shape of the curve throughout the year is generally similar to those of prior years, except for the exaggeration of the Base Flow Curve as previously discussed. During periods of Storm Flow when changes in storage occurred in Prado reservoir, the inflow hydrograph was used as a guide.

(7) Arriving at an opinion of the location of the curve separating the two components of flow required the exercise of judgment, taking into consideration items (1) through (6) above and, to some extent, the variation in Base Flow which occurred in the previous water year.

(8) The Base Flow curve is used for separation of components of flow during storm intervals. Mean daily Storm Flow was computed by subtracting the value of the Base Flow curve from the computed total mean daily inflow. For these days, Base Flow was designated as the value shown on the Base Flow Curve.

(9) In addition to the State Water project flows at Prado, which were determined in item (3) above, the State Project water releases during 1972-73 increased the flows due to rising water from the Riverside groundwater basin. Of the total State Project water released into Santa Ana River upstream of Riverside Narrows during water year 1972-73, 473 acre-feet were delivered through Prado Dam and 11,140 acre-feet remained in groundwater storage at the end of that water year. The members of the Watermaster agreed that 980 acre-feet of the 11,140 acre-feet arrived at Prado during 1973-74. They also agreed that 20 acre-feet were lost due to evapo-transpiration and 10,140 acre-feet remained in groundwater storage on September 30, 1974. It was also agreed that these amounts could be modified if warranted by the investigation to be conducted during the coming year.

(10) For those days outside the storm periods, Base Flow was accepted as the computed inflow less the Nontributary flows.

Water Quality

During the water year 1973-74, the weighted average total dissolved solids (TDS) for the total flow, including Nontributary flow, passing Prado was found to be 462 ppm. This determination of the water quality at the USGS gaging station below Prado Dam was made using measurements obtained by the USGS which operates a water quality monitoring recorder at this station. A continuous stream of water from the Santa Ana River is pumped to the water quality monitor. A continuous record of data recorded on a punched tape is obtained for determination of specific conductivity and temperature. Average daily values for TDS which were generated from specific conductance data recorded at this water quality station are shown on Plate 3.

The plot of TDS on Plate 3 shows the effects of the State Project water. In general, the TDS fluctuated in the 300 to 500 ppm range when the State Project water was being released. During April when the release of State Project water was reduced to 50 cfs, there was a corresponding increase in TDS to the 500 to 600 ppm range. During periods when State Project water was not being released, the TDS generally fluctuated in the 700 to 800 ppm.

Personnel from the USGS make weekly inspections of the station to determine if equipment is operating satisfactorily and to secure grab samples of water from the river for laboratory determinations of total dissolved solids and for specific conductance. During periods of storm runoff the USGS visits the station at least once each day for the purpose of taking additional grab samples to provide a more detailed record of possible changes in water quality during periods of Storm Flow. These samples are analyzed for TDS and for specific conductance.

At the end of each month, the punched tape from the Prado monitoring unit is transmitted to Washington, D.C. for machine processing. A summary tabulation of data for all items is obtained. The summary also shows the maximum, minimum and the mean hourly reading each day of record. The results of the machine processing are returned to the USGS staff in Garden Grove, California for review and to eliminate inconsistent data. A corrected summary is then made available to the Watermaster, along with a more detailed record of specific conductances showing instantaneous values at two-hour intervals.

Utilizing the USGS water quality records, the following analyses were performed by the Watermaster to determine the annual weighted TDS:

(1) The specific conductivity of the Santa Ana River below Prado was relatively uniform for most days of the year. On these days, the mean hourly specific conductance, as computed by the USGS, was accepted as representative of the daily weighted value.

(2) During periods when the daily discharge varied, numerous flow measurements, together with the respective specific conductance measurement, were used to determine the weighted mean daily specific conductance value.

(3) Laboratory analyses of the 43 grab samples taken by the USGS below Prado Dam during the 1973-74 season were run to determine both specific conductance and TDS. Results of these analyses were used to prepare a correlation between specific conductance and the corresponding TDS. A detailed discussion of this statistical analysis is presented in the following section.

(4) The resulting equation from the curve fitting operation was then used to determine the mean daily TDS corresponding to the mean daily specific conductance values for each day of the year.

(5) The mean daily TDS values were then multiplied by the mean daily flow. These products were then summed and divided by the total flow for the year to determine the weighted average TDS value for the water year. This value for TDS for the total flow including Nontributary water was 462 ppm of total dissolved solids for the 1973-74 water year. This value hereinafter is adjusted for the quality of the Nontributary flow.

Statistical Analysis of EC and TDS Relationships

An analysis of the correlation of electrical conductivity versus total dissolved solids in the Santa Ana River below Prado Dam for the water year 1973-74 was analyzed through the use of a

TDS AS A FUNCTION OF E.C.
BELOW PRADO DAM

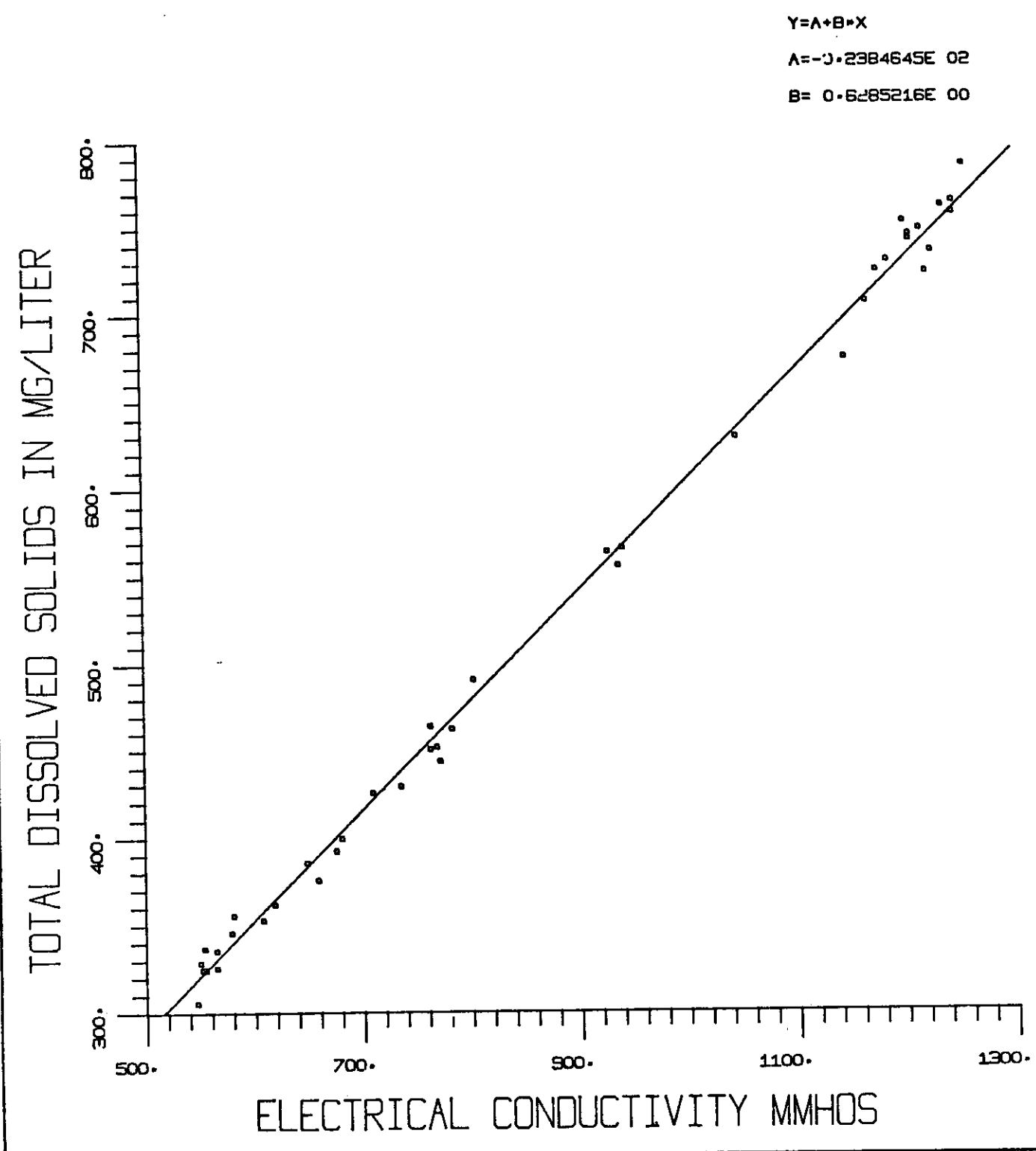


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FIGURE 4

statistical computer program. This is a linear regression program for data sets in two variables; x and y. From input data points, described by their x and y coordinates, an equation is produced that best fits these points from a least squares viewpoint. The computer program calculates six different types of equations based on the assumption that y (TDS) is a function of the independent variable x (EC). The computer output results of the analysis of the 1973-74 data is shown below.

Form of Equation	Curve Type	Correlation Coefficient	Y-Intercept (A)	Slope (B)
(1) TDS=A+B (EC)	Linear	0.9948	-23.85	0.6285
(2) TDS=A[EXP (BxEC)]	Exponential	0.9891	175.79	11.92×10^{-4}
(3) TDS=A $(EC)^B$	Power Function	0.9939	0.4409	1.045
(4) TDS=A+B/EC	Hyperbolic	0.9734	1084.4	-44.43×10^{-4}
(5) TDS=1/[A+B (EC)]	Hyperbolic	0.9713	41.92×10^{-4}	-23.79×10^{-7}
(6) TDS=EC/[A+B (EC)]	Hyperbolic	0.9909	1.753	-92.07×10^{-6}

Note that the value of the correlation coefficient for equation (1) most nearly approaches 1.000-the value which represents a perfect correlation between x and y data points. On the basis of these statistics, equation (1) was selected as the relationship for relating the 1973-74 USGS mean daily electrical conductivity values to mean daily TDS values. The equation, as shown on Figure 4, used for this relationship was:

$$TDS = -23.85 + (0.6285)\,(EC)$$

Water Quality Adjustment for Nontributary Water

The weighted average annual TDS value of 462 ppm, as stated previously, includes the effects of the State Project water during this water year and the preceding water year. The value also includes the effects of 1,109 acre-feet of 1972-73 Base Flow released in 1973-74 water year. Therefore, the volumes of water and the amounts of salts contributed by these releases were subtracted from the quantities which determine the TDS value. The flow-weighted average TDS of the State Project water released at Devil Canyon during water year 1973-74 was 218 ppm. The flow-weighted average TDS of State water released during 1972-73 was 235 ppm. The average TDS of the 1972-73 Base Flow released during 1973-74 was 729 ppm. After adjusting for these releases. the weighted average annual TDS value for 1973-74 is 704 ppm. The basic information used in the statistical analysis is included herein as Appendix D.

Adjusted Base Flow

According to the Judgment, "The amount of Base Flow at Prado received during any year shall be subjected to adjustment based on weighted average annual TDS in Base Flow and Storm Flow at Prado as follows:

If the Weighted Average TDS in Base Flow and Storm Flow at Prado is:	Then the Adjusted Base Flow shall be determined by the formula:
Greater than 800 ppm	$Q - \frac{35}{42,000} Q\ (TDS-800)$
700 ppm - 800 ppm	Q
Less than 700 ppm	$Q + \frac{35}{42,000} Q\ (700-TDS)$

Where: Q=Base Flow actually received."

As noted previously, the Base Flow of the Santa Ana River below Prado Dam determined by the Watermaster amounted to 43,769 acre-feet for water year 1973-74. The weighted average annual TDS of the total flow is 704 ppm. No adjustment to the Base Flow of 43,769 acre-feet is necessary because the value of the weighted average annual TDS lies between 700 and 800 ppm.

Entitlement and Credit or Debit

From pages 12 and 13 of the Judgment, the following description of the obligation of the CBMWD and WMWD is given: "CBMWD and WMWD shall be responsible for an average annual adjusted Base Flow of 42,000 acre-feet at Prado....CBMWD and WMWD each year shall be responsible for not less than 37,000 acre-feet of Base Flow at Prado, plus one-third of any cumulative debit..."

The Watermaster is required to maintain a continuing account of a list of permanent items at Prado for each year. A list of these items and the 1973-74 values are shown below:

(1)	Base Flow at Prado	43,769 acre-feet
(2)	Annual Weighted TDS of Total Flow	704 ppm
(3)	Annual Adjusted Base Flow	43,769 acre-feet
(4)	Cumulative Adjusted Base Flow	174,118 acre-feet
(5)	Cumulative Entitlement of OCWD at Prado	168,000 acre-feet
(6)	Cumulative Credit (4)-(5)	6,118 acre-feet
(7)	One-Third of Cumulative Debit	0 acre-feet
(8)	Minimum Required Base Flow in 1974-75	37,000 acre-feet

Nontributary State Project water and Base Flow flowing in outlet channel downstream of Prado Dam

CHAPTER V

BASE FLOW AT RIVERSIDE NARROWS

The Judgment states that SBVMWD is "responsible for an average annual Adjusted Base Flow of 15,250 acre-feet at Riverside Narrows". This chapter deals with the analysis of the flow at Riverside Narrows, the calculation of the amount of Base Flow received and credited to SBVMWD, and the calculation of the amount of Base Flow received and credited to SBVMWD, and the calculation of the Adjusted Base Flow, the adjustment being made on the basis of the weighted average annual TDS in the Base Flow.

Total Discharge at Riverside Narrows

The surface flow of the river at the Riverside Narrows has been measured by the USGS since 1929, first at a gaging station located approximately one-half mile downstream from the Union Pacific Railroad Bridge, which was moved in 1943 to a downstream location at Pedley crossing, now known as Van Buren Boulevard. A flood which occurred during the 1968-69 water year washed out a portion of the bridge across the river at this location. This increased the difficulty of maintaining the surface gage at Van Buren Boulevard, and led to the installation of a surface water gaging station upstream a short distance above The Metropolitan Water District Upper Feeder Bridge crossing which is situated on the opposite side of the river from the original location of the Riverside Narrows surface water gaging station. This surface water gaging station, which is 1½ miles upstream from Van Buren Boulevard, also houses a monitor for the determination of electrical conductivity.

In 1947, the City of Riverside constructed a sewage treatment plant a short distance upstream from Van Buren Boulevard. This plant was enlarged in 1968 and the effluent was discharged directly to the Santa Ana River upstream from Van Buren Boulevard, with the result that the surface water flow at Van Buren Boulevard includes the sewage effluent from the Riverside Water Quality Control Plant.

For the year of 1971-72, the Base Flow component was calculated at the two gaging stations, one at Van Buren Boulevard and the other at the MWD Upper Feeder crossing. The Base Flow, as calculated at the Upper Feeder crossing, was found to be slightly higher than that calculated at Van Buren Boulevard, and for the year of 1971-72 it was the Watermaster's decision that the Base Flow at the Riverside Narrows would be defined as that portion of the total surface flow passing the

gaging station at Van Buren Boulevard which remained after the deduction of Storm Flow and the wastewater discharge to the river by the City of Riverside above the measuring plant.

Dual measurements were continued during the year of 1972-73 through June of 1973, at which time the USGS discontinued measurements at the Van Buren Boulevard gaging station. The surface water gaging station just upstream of the MWD Upper Feeder Bridge crossing has been used as the source of flow data for the 1973-74 water year.

Nontributary Flow

During the period May through September 1973, Nontributary water from the East Branch of the California Aqueduct was released into the Santa Ana River in the vicinity of Colton. This release was made at the request of the Orange County Water District and totaled 11,617 acre-feet. This water percolated into the Riverside Basin and for the water year 1972-73, the Watermaster reached the conclusion that as of September 30, 1973, 477 acre-feet had passed Riverside Narrows.

At the beginning of the 1973-74 water year, the remaining 11,140 acre-feet of Nontributary water existed as water in storage in the Riverside Basin, moving toward the Riverside Narrows where either all or part of it will appear as rising water. Because of the nature of its movement, it is impossible to distinguish this Nontributary water from normal Base Flow by means of scalping procedures used by the Watermaster. During the past year some indication of the amount of this Nontributary water reaching Riverside Narrows could be derived from a water quality study (the Nontributary water is of better quality from a total dissolved solids point-of-view than normal Base Flow), but even this type of distinction will be completely masked in a short period of time.

Accordingly, the Orange County Water District conducted a detailed mathematical analysis of the recharge operation based on the Dupuit-Forcheimer approximations to Darcy's Law for flow through porous media. An analysis of this nature working with as complex a system as an alluvium-formed aquifer must incorporate many simplifying assumptions so that the resulting equations can be solved. This has been accomplished in a preliminary form, and the Watermaster is in the process of reviewing the results. Due to the time factor, however, in developing a Base Flow value by February for this water year, 1973-74, the Watermaster has accepted, on a tentative basis, the results of the mathematical analysis for the year 1973-74, and has adjusted it to a rounded-off value of 1,000 acre-feet. During the coming year, (74-75), the Watermaster will attempt to conclude its analysis and negotiation on this Nontributary water and develop a statement on how it should be handled in future years. The Watermaster has agreed that the value of 477 acre-feet and 1,000

acre-feet for the water years 1972-73 and 1973-74, respectively, may be modified and such modifications incorporated in next year's findings, if the agreed-upon solution indicates that such modifications are warranted.

Components of Flow

The components of the total flow of the Santa Ana River at Riverside Narrows at MWD Crossing for the 1973-1974 water year include Nontributary, Storm and Base Flow. These components, by months, as listed on Table 5, represent an average value derived from calculations made by the five members of the Watermaster.

TABLE 5

COMPONENTS OF FLOW AT RIVERSIDE NARROWS FOR WATER YEAR 1973-74
(Quantities in Acre-Feet)

Month		Total Flow USGS Measurement	Nontributary Flow	Storm Flow	Base Flow
1973	October	1,258	83	0	1,175
	November	1,718	83	443	1,192
	December	1,434	83	12	1,339
1974	January	8,083	83	6,535	1,465
	February	1,831	83	28	1,720
	March	3,078	83	1,148	1,847
	April	1,749	83	125	1,541
	May	1,660	83	0	1,577
	June	1,297	84	0	1,213
	July	1,190	84	0	1,106
	August	1,123	84	0	1,039
	September	1,073	84	0	989
Total - Acre Feet		25,494	1,000	8,291	16,203

The total flow, as shown in Table 5, consists of 3.92% of Nontributary Flow, 32.52% Storm Flow, and 63.56% Base Flow.

Base Flow

The hydrograph of the river flow at the MWD Crossing shows the scalped Storm Flow component colored in red on Plate 4. Based on this hydrograph and utilizing in general the same procedures as are reflected in the Work Papers of the engineers (as referenced in Paragraph 2 of the Engineering Appendix of the Judgment), a separation was made between Storm Flow and the sum of Base Flow and Nontributary water and the two components calculated. Nontributary water was assumed to be equally distributed throughout the year (1,000 acre-feet divided by 12 months) and subtracted from the sum of the Base Flow and Nontributary water to arrive at Base Flow.

Each of the five members of the Watermaster independently made a determination of each component, based on his own judgment and his own interpretation of the method used in the previously referenced Work Papers. The value for Base Flow of 16,203 acre-feet, as shown on Table 5 is the mathematical average of the five determinations. Plate 4 is indicative of the scalping done by the Watermaster.

Water Quality

Under the terms of the Judgment it is necessary to determine the weighted average total dissolved solids (TDS) content of the Base Flow at Riverside Narrows.

To accomplish this, the USGS has installed a specific conductance measuring device and recorder immediately upstream from the river crossing of the Upper Feeder of MWD, which is also upstream from the point of discharge of the effluent from the Riverside Water Quality Control Plant to the river. The USGS operates and maintains this monitoring device in the same manner as the station operated at below Prado Dam. The data collected from this monitor are augmented by periodic grab samples.

During the water year 1973-74, 50 samples were taken from the waters of the Santa Ana River at the MWD Crossing for laboratory analysis, to determine the TDS and EC of each sample. All 50 samples were used in a statistical analysis for the determination of the relationship of EC to TDS. Appendix E includes the complete statistical analysis.

Statistical Analysis of EC and TDS Relationships

Six different types of equations were utilized, based upon the assumption that TDS was a function of the independent variable EC, to determine the equation providing the best correlation. The analysis was made utilizing a multiple regression computer program which determined the best curve fitting equation for the 50 laboratory samples.

The results of the computer analysis of the 1973-74 data are shown as follows:

Form of Equation	Curve Type	Multiple Correlation Coefficient	Coefficient Term (A)	Constant Term (B)
(1) $TDS = A(EC) + B$	Linear	0.974	0.6230	0.1546
(2) $TDS = A[\ln(EC)] + B$	Logarithmic	0.964	386.3280	-2021.8222
(3) $TDS = \frac{1.0}{A(EC) + B}$	Hyperbolic	0.982	-4.529×10^{-6}	6.421×10^{-3}
(4) $TDS = A[e^{B(EC)}]$	Exponential	0.986	123.06344	0.00156
(5) $TDS = \frac{EC}{A(EC) + B}$	Hyperbolic	0.997	5.1×10^{-5}	1.54979
(6) $TDS = A(EC)^B$	Exponential	0.991	0.68777	0.9858

Note that the value of the multiple correlation coefficient for equation (5) most nearly approaches 1.0000 - the value which represents a perfect correlation between the TDS and EC samples. Based on the above computer analysis, equation (5) was selected as the relationship for relating the 1973-74 mean daily electrical conductivity values to the adjusted daily TDS values. The equation used for this relationship was:

$$TDS = \frac{EC}{0.000051(EC) + 1.54979}$$

The adjusted daily TDS calculated by the above equation was then multiplied by the mean daily flow for each day of the year as shown on Table No. E-2, Appendix E, entitled "Weighted T.D.S. Calculation Sheet".

Because the Judgment provides that only the base flow at the Riverside Narrows may be used for determining the weighted average annual TDS, the calculation sheets separate the total flow into two parts, the Storm Flow and the sum of Nontributary and Base Flow. The two components used were those developed by Mr. Albert A. Webb, because he was responsible for this particular

calculation of the weighted water quality. The monthly totals of the product of the adjusted TDS and the three flows (Total, Storm, and Nontributary + Base) were calculated for each month.

The adjusted TDS during Storm Flows were corrected averaging the TDS on the day before and the day after the storm as shown on Table No. E-2 of Appendix E. The corrected TDS were then multiplied by the Nontributary and Base Flow component only, and has been noted by one asterisk on the calculation sheets on said Table No. E-2.

The calculation sheets on said Table No. E-2 have been summarized on Table No. E-3 of Appendix E, entitled "Summary of Water Quality for the Riverside Narrows at Metropolitan Water District (MWD) Crossing". The weighted average annual total dissolved solids in parts per million (ppm) of the Santa Ana River at MWD crossing for water year 1973-74, for the Nontributary and Base Flow component was 674 ppm. To adjust this for Base Flow only, it was assumed that the Nontributary water had an original quality of 235 ppm. The adjustment for the Nontributary water results in a TDS for Base Flow only of 700 ppm.

A plot of the TDS of the total daily flow, including Nontributary water, at the MWD Crossing for the water year 1973-74 is shown on Plate 5, together with the San Bernardino rainfall.

Adjusted Base Flow at Riverside Narrows

The Judgment provides that the amount of Base Flow at Riverside Narrows received during any year shall be subject to adjustment based on the weighted average annual TDS in such Base Flow as follows:

If the Weighted Average TDS in Base Flow at Riverside Narrows is:	Then the Adjusted Base Flow shall be Determined by the Formula:
Greater than 700 ppm	$Q - \frac{11}{15,250} Q\ (TDS-700)$
600 ppm - 700 ppm	Q
Less than 600 ppm	$Q + \frac{11}{15,250} Q\ (600-TDS)$

Where Q = Base Flow actually received.

From the previous subsection, the weighted average annual TDS in the Base Flow at Riverside Narrows for the water year 1973-74 was 700 ppm. Therefore, no adjustment to the Base Flow of 16,203 acre-feet was necessary because the value of the weighted average annual TDS was not greater than 700 ppm.

Entitlement and Credit or Debit

Paragraph 5(b) of the Judgment states that "SBVMWD shall be responsible for an average annual Adjusted Base Flow of 15,250 acre-feet at Riverside Narrows.....SBVMWD each year shall be responsible at Riverside Narrows for not less than 13,420 acre-feet of Base Flow plus one-third of any cumulative debit...."

A list of the accounting items and the 1973-74 values for these items, as required by Paragraph 4 of the Engineering Appendix to the Judgment, is detailed below:

(1)	Base Flow at Riverside Narrows	16,203 acre-feet
(2)	Annual Weighted TDS of Base Flow at Riverside Narrows	700 ppm
(3)	Annual Adjusted Base Flow	16,203 acre-feet
(4)	Cumulative Adjusted Base Flow	66,337 acre-feet
(5)	Cumulative Entitlement of CBMWD and WMWD at Riverside Narrows	61,000 acre-feet
(6)	Cumulative Credit (4)-(5)	5,337 acre-feet
(7)	One-third of Cumulative Debit	0
(8)	Minimum Required Base Flow in 1973-74	13,420 acre-feet

APPENDIX A

HISTORY OF LITIGATION

HISTORY OF LITIGATION

The complaint in this case was filed by the Orange County Water District on October 18, 1963 seeking an adjudication of water rights against more than 2,500 water users in the area tributary to Prado Dam within the Santa Ana River Watershed. Thirteen cross-complaints were filed in 1968 extending the adjudication to include an additional 1,500 water users in the area downstream from Prado Dam. Thus, there were involved in this case some 4,000 parties. It became obvious that every effort should be made to arrive at a settlement and a physical solution in order to avoid the enormous and unwieldy litigation that would be involved.

Efforts to arrive at a settlement and physical solution were pursued by public officials, individuals, attorneys, and engineers. Attorneys for the parties organized in order to further this objective. Among other things, they provided guidance for the formation and activities of an engineering committee to provide them with information on the physical facts.

An initial meeting of the engineers representing the parties was held on January 10, 1964. Agreement was reached that it would be beneficial to jointly undertake the compilation of basic data. Liaison was established with the Department of Water Resources, State of California, on requests for information to be obtained from the State's studies for use by the parties. Engineers representing the parties were divided into sub-committees which were given the responsibility of investigating such things as the boundary of the Santa Ana River watershed and its subareas, standardization of the terminology, the location and description of wells and diversion facilities, waste disposal and transfers of water between subareas.

On April 30, 1964, the joint engineering committee prepared a list of preliminary engineering studies directed toward settlement of the Santa Ana River water rights litigation. This list of basic information was in response to a request from the attorneys' committee at a meeting held April 17, 1964. Special assignments were made on selected items to individual engineers to provide information requested by the attorneys' committee.

The attorneys and engineers for the defendants then commenced a series of meetings separate from the representatives of the plaintiff in order to consolidate their position and to determine their course of action. On October 7, 1964 engineers for the defendants presented the results of the studies made by the joint engineering committee. The defendants' attorneys requested that additional information be provided on the methods of measuring flow at Prado and the historical supply and disposal of water passing Prado Dam segregated into the components of flow and

designating the amount of supply which was usable by the downstream area. On December 11, 1964, this supplemental information was presented to the defendants' attorneys.

During 1965, engineers and attorneys for the defendants held numerous conferences and conducted additional studies in an attempt to determine their respective positions in the case. Early in 1966, the plaintiff and defendants exchanged drafts of possible principles of settlement. Commencing March 22 and ending April 13, 1966, four meetings were held by the engineers to discuss the draft of principles for settlement.

On February 25, 1968 the defendants submitted a request to the Court that an Order of Reference be issued requesting the State Department of Water Resources to determine the physical facts. On May 9, 1968 the plaintiff's attorney submitted motions opposing the Order of Reference and requesting that a preliminary injunction be issued. In the meantime, every effort was being made to come to an agreement on a stipulated judgment. Commencing on February 28, 1968 and extending until May 14, 1968, six meetings were held to determine the scope of physical facts on which agreement could be reached so that if an Order of Reference were to be approved by the Court, the work under the proposed reference would not repeat the extensive basic data collection and compilation which had already been completed and on which engineers for both plaintiffs and defendants had reached substantial agreement. Such basic data were compiled and published in two volumes under date of May 14, 1968 entitled "Appendix A. Basic Data."

On May 21, 1968 an outline of a proposal for settlement of the case was prepared and a committee of attorneys and engineers for the parties commenced preparation of the settlement documents. On June 16, 1968, the Court held a hearing on the motions it had received requesting a preliminary injunction and an Order of Reference. The parties requested that the Court delay the hearings on these motions in view of the efforts toward settlement that were underway. The plaintiff, however, was concerned regarding the necessity of bringing the case to trial within the statutory limitation and, accordingly, on July 15, 1968 submitted a motion to set the complaint in the case for trial. On October 15, 1968 the trial was commenced and was adjourned after one-half day of testimony on behalf of the plaintiff. Thereafter, the parties filed with the Court the necessary Settlements Documents including a Stipulation for Judgment. The Court entered the Judgment on April 17, 1969. This terminated the many years of controversy over water rights along the Santa Ana River involving the issues and parties embraced in Orange County Water District versus City of Chino, et al.

APPENDIX B

SUMMARY OF JUDGMENT

SUMMARY OF JUDGMENT

Provisions of the Judgment became effective on October 1, 1970. The Judgment does not define the water rights of the individual claimants. Instead, it provides for a regional allocation of water supply of the Santa Ana River system and establishes entitlements and obligations among the four existing major public water districts overlying the aggregate of substantially all of the major areas of water use in the watershed. Dismissals were entered as to all defendants and cross defendants other than these four major public districts. These districts, the locations of which are shown on Plate 1, "Santa Ana River Watershed," are the remaining parties to the Judgment and are as follows:

(1) Orange County Water District (OCWD), representing all lower basin entities which are located within Orange County downstream from Prado Dam.

(2) Western Municipal Water District (WMWD), representing middle basin entities located within Riverside County on both sides of the Santa Ana River primarily upstream from Prado Dam.

(3) Chino Basin Municipal Water District (CBMWD), located in San Bernardino County Chino Basin area, representing middle basin entities within its boundaries and located primarily upstream from Prado Dam.

(4) San Bernardino Valley Municipal Water District (SBVMWD), representing all entities within its boundaries, and embraced within the upper portion of the Riverside Basin Area, the Colton Basin area (being an upstream portion of the middle basin) and the San Bernardino Basin area, being essentially the upper basin.

A physical solution under the stipulated Judgment provides, in general, that SBVMWD shall be responsible for the delivery of an average annual amount of Base Flow at Riverside Narrows and CBMWD and WMWD shall jointly be responsible for an average annual amount of Base Flow at Prado. Essential to the understanding of the provisions of the Judgment is the definition of certain important terms. The total surface flow passing a point of measurement is divided into components, which are defined in the Judgment as follows:

"(1) Storm Flow - That portion of the total surface flow passing a point of measurement, which originates from precipitation and runoff without having first percolated to ground water storage in the zone of saturation, calculated in accordance with procedures referred to in Exhibit B.

(2) Base Flow - That portion of the total surface flow passing a point of measurement which remains after deduction of storm flow.

(3) Adjusted Base Flow - Actual base flow in each year adjusted for quality as provided . . ."

The Judgment sets forth a declaration of rights. Briefly stated, the Judgment provides that the water users in the area downstream from Prado Dam have rights, as against the upstream users, to receive an average annual supply of 42,000 acre-feet of Base Flow at Prado Dam, together with the right to all Storm Flow reaching Prado Dam. Water users in the area upstream of Prado Dam, as against the downstream users, have the right to divert, pump, extract, conserve, store and use all surface and ground water supplies originating within the upper area, so long as the lower area receives the water to which it is entitled.

The physical solution set forth in the Judgment requires that SBVMWD shall be responsible for an average annual Adjusted Base Flow of 15,250 acre-feet at Riverside Narrows subject each year to the following:

(1) A minimum Base Flow of 13,420 acre-feet plus one-third of any cumulated debit.

(2) After October 2, 1986, if no cumulated debit exists, the minimum quantity shall be 12,420 acre-feet.

(3) Prior to 1986, if the cumulated credit exceeds 10,000 acre-feet the minimum quantity shall be 12,420 acre-feet.

(4) All cumulated debits shall be removed by the discharge of a sufficient Base Flow at Riverside Narrows at least once in every ten consecutive years following October 1, 1976. Any accumulated credits shall remain on the books of account until used to offset any subsequent debits or until otherwise disposed of by SBVMWD.

(5) The Base Flow at Riverside Narrows shall be adjusted using weighted average annual TDS in such Base Flow in accordance with the formula set forth in the Judgment.

The obligations under the physical solutions for meeting the Adjusted Base Flow of 42,000 acre-feet at Prado Dam for the benefit of the downstream water users as shared by CBMWD and WMWD are as follows:

(1) Minimum Base Flow at Prado shall not be less than 37,000 acre-feet plus one-third of any cumulated debit.

(2) After October 1, 1986, if no cumulated debit exists, the minimum quantity shall be 34,000 acre-feet.

(3) Prior to 1986, if the cumulated credit exceeds 30,000 acre-feet, the minimum quantity shall be 34,000 acre-feet.

(4) Sufficient quantities of Base Flow shall be provided at Prado to discharge completely any cumulated debits at least once in any ten consecutive years following October 1, 1976. Any cumulative credits shall remain on the books of account until used to offset any subsequent debits, or until otherwise disposed of by CBMWD and WMWD.

(5) The Base Flow at Prado during any year shall be adjusted using the weighted average annual TDS in the total flow at Prado (Base Flow plus Storm Flow) in accordance with the formula set forth in the Judgment.

The accounting provided for under the Judgment allows credit to be earned when the average annual Adjusted Base Flow exceeds 15,250 acre-feet at Riverside Narrows and 42,000 acre-feet at Prado. Debits accrue when the average annual Adjusted Base Flow falls below the above quantities at the respective locations. The adjustment of Base Flow for water quality is to provide an incentive to maintain a better quality water as a result of implementation of the physical solution. That is, when the water quality is improved over a certain amount, the quantitative amount of the obligation is decreased; but when that water quality is impaired beyond a specified limit, the quantity of the obligation is increased. This is one of the first comprehensive adjudications in Southern California which includes provisions applicable to the quality of water in addition to the determination of quantitative rights.

APPENDIX C

NONTRIBUTARY WATER DELIVERED TO ORANGE COUNTY WATER DISTRICT BY MWD FROM THE RIALTO FEEDER TO SAN ANTONIO WASH NEAR MONTCLAIR (CONNECTION OC59-T)

1973-74

Prepared By

Albert A. Webb

TABLE NO. C-1

SUMMARY
OF
NONTRIBUTARY WATER RELEASED AT OC-59T
FROM DEVIL CANYON POWER PLANT AFTERBAY
TO M.W.D. RIALTO PIPELINE
WATER YEAR 1973-74

Month	Acre Feet
October	0
November	0
December	7,402
January	2,623
February	7,337
March	1,529
April	3,127
May	5,505
June	7,761
July	11,469
August	12,128
September	6,197
Total	65,078

TABLE NO. C-2

NONTRIBUTARY WATER FROM DEVIL CANYON POWERPLANT ARTERBAY (OC-59T) AS DISCHARGED TO M. W. D. RIALTO PIPELINE FROM 36" AND 90" VENTURI METERS

December, 1973

Day	36" Meter A.F.	36" Meter cfs	90" Meter A.F.	90" Meter cfs	Total From 36" & 90" Meters A.F.	Total From 36" & 90" Meters cfs
1	0	0	0	0	0	0
2	0	0	0	0	0	0
3	43.01	21.7	0	0	43.01	21.7
4	101.55	51.2	0	0	101.55	51.2
5	34.63	17.5	152.64	77.0	187.27	94.5
6	0	0	198.38	100.0	198.38	100.0
7	0	0	249.60	125.8	249.60	125.8
8	0	0	272.70	137.5	272.70	137.5
9	0	0	360.37	181.7	360.37	181.7
10	0	0	395.21	199.3	395.21	199.3
11	0	0	392.19	197.7	392.19	197.7
12	0	0	391.63	197.5	391.63	197.5
13	0	0	363.23	183.1	363.23	183.1
14	0	0	281.21	141.8	281.21	141.8
15	0	0	0	0	0	0
16	0	0	0	0	0	0
17	0	0	0	0	0	0
18	0	0	0	0	0	0
19	0	0	0	0	0	0
20	0	0	0	0	0	0
21	3.63	1.8	244.81	123.4	248.44	125.2
22	0	0	391.75	197.5	391.75	197.5
23	0	0	391.75	197.5	391.75	197.5
24	0	0	391.75	197.5	391.75	197.5
25	0	0	391.75	197.5	391.75	197.5
26	0	0	391.75	197.5	391.75	197.5
27	0	0	391.75	197.5	391.75	197.5
28	0	0	391.75	197.5	391.75	197.5
29	0	0	391.76	197.5	391.76	197.5
30	0	0	391.76	197.5	391.76	197.5
31	0	0	391.76	197.5	391.76	197.5
Total	182.82	92.2	7,219.50	3,639.8	7,402.32	3,732.0

NONTRIBUTARY WATER FROM DEVIL CANYON POWERPLANT AFTERBAY (OC-59T) AS DISCHARGED TO M. W. D. RIALTO PIPELINE FROM 36" AND 90" VENTURI METERS

January, 1974

Day	36" Meter A.F.	36" Meter cfs	90" Meter A.F.	90" Meter cfs	Total From 36" & 90" Meters A.F.	Total From 36" & 90" Meters cfs
1	0	0	391.75	197.5	391.75	197.5
2	0	0	391.75	197.5	391.75	197.5
3	0	0	391.76	197.5	391.76	197.5
4	0	0	167.68	84.5	167.68	84.5
5	0	0	0	0	0	0
6	0	0	0	0	0	0
7	0	0	0	0	0	0
8	0	0	0	0	0	0
9	0	0	0	0	0	0
10	0	0	0	0	0	0
11	0	0	0	0	0	0
12	0	0	0	0	0	0
13	0	0	0	0	0	0
14	0	0	0	0	0	0
15	0	0	0	0	0	0
16	0	0	0	0	0	0
17	0	0	0	0	0	0
18	0	0	0	0	0	0
19	0	0	0	0	0	0
20	0	0	0	0	0	0
21	0	0	0	0	0	0
22	0	0	0	0	0	0
23	0	0	0	0	0	0
24	0	0	0	0	0	0
25	0	0	0	0	0	0
26	0	0	0	0	0	0
27	0	0	0	0	0	0
28	0	0	256.68	129.4	256.68	129.4
29	0	0	396.46	199.9	396.46	199.9
30	0	0	383.40	193.3	383.40	193.3
31	0	0	243.76	122.9	243.76	122.9
Total	0	0	2,623.24	1,322.5	2,623.24	1,322.5

NONTRIBUTARY WATER FROM DEVIL CANYON POWERPLANT AFTERBAY (OC-59T) AS DISCHARGED TO M. W. D. RIALTO PIPELINE FROM 36" AND 90" VENTURI METERS

February, 1974

Day	36" Meter A.F.	36" Meter cfs	90" Meter A.F.	90" Meter cfs	Total From 36" & 90" Meters A.F.	Total From 36" & 90" Meters cfs
1	0	0	0	0	0	0
2	0	0	0	0	0	0
3	0	0	0	0	0	0
4	0	0	0	0	0	0
5	0	0	260.12	131.1	260.12	131.1
6	0	0	499.43	251.8	499.43	251.8
7	0	0	503.33	253.8	503.33	253.8
8	0	0	372.64	187.9	372.64	187.9
9	0	0	305.63	154.1	305.63	154.1
10	0	0	305.63	154.1	305.63	154.1
11	0	0	305.63	154.1	305.63	154.1
12	0	0	305.63	154.1	305.63	154.1
13	0	0	305.63	154.1	305.63	154.1
14	0	0	305.63	154.1	305.63	154.1
15	0	0	305.63	154.1	305.63	154.1
16	0	0	214.29	108.0	214.29	108.0
17	5.85	3.0	112.94	56.9	118.79	59.9
18	0	0	302.39	152.5	302.39	152.5
19	0	0	302.39	152.5	302.39	152.5
20	0	0	302.39	152.5	302.39	152.5
21	0	0	302.39	152.5	302.39	152.5
22	0	0	302.39	152.5	302.39	152.5
23	0	0	302.39	152.4	302.39	152.4
24	0	0	302.39	152.4	302.39	152.4
25	0	0	302.39	152.4	302.39	152.4
26	0	0	302.39	152.4	302.39	152.4
27	0	0	302.39	152.4	302.39	152.4
28	0	0	204.98	103.4	204.98	103.4
29	-	-	-	-	-	-
30	-	-	-	-	-	-
31	-	-	-	-	-	-
Total	5.85	3.0	7,331.04	3,696.1	7,336.89	3,699.1

NONTRIBUTARY WATER FROM DEVIL CANYON POWERPLANT AFTERBAY (OC-59T) AS DISCHARGED TO M. W. D. RIALTO PIPELINE FROM 36" AND 90" VENTURI METERS

March, 1974

Day	36" Meter A.F.	36" Meter cfs	90" Meter A.F.	90" Meter cfs	Total From 36" & 90" Meters A.F.	Total From 36" & 90" Meters cfs
1	0	0	0	0	0	0
2	0	0	0	0	0	0
3	0	0	0	0	0	0
4	0	0	0	0	0	0
5	0.28	0.1	0	0	0.28	0.1
6	0	0	0	0	0	0
7	0	0	0	0	0	0
8	0	0	0	0	0	0
9	0	0	0	0	0	0
10	0	0	0	0	0	0
11	0	0	0	0	0	0
12	0	0	0	0	0	0
13	0	0	0	0	0	0
14	0	0	0	0	0	0
15	0	0	0	0	0	0
16	0	0	0	0	0	0
17	0	0	0	0	0	0
18	0	0	0	0	0	0
19	0	0	0	0	0	0
20	0	0	0	0	0	0
21	6.98	3.5	120.67	60.8	127.65	64.3
22	0	0	200.40	101.0	200.40	101.0
23	0	0	50.83	25.6	50.83	25.6
24	0	0	0	0	0	0
25	5.99	3.1	118.24	59.6	124.23	62.7
26	0	0	196.85	99.3	196.85	99.3
27	0	0	196.85	99.3	196.85	99.3
28	0	0	196.85	99.3	196.85	99.3
29	0	0	196.85	99.2	196.85	99.2
30	0	0	196.85	99.3	196.85	99.3
31	0	0	41.91	21.1	41.91	21.1
Total	13.25	6.7	1,516.30	764.5	1,529.55	771.2

NONTRIBUTARY WATER FROM DEVIL CANYON POWERPLANT AFTERBAY (OC-59T) AS DISCHARGED TO M. W. D. RIALTO PIPELINE FROM 36" AND 90" VENTURI METERS

April, 1974

Day	36" Meter A.F.	36" Meter cfs	90" Meter A.F.	90" Meter cfs	Total From 36" & 90" Meters A.F.	Total From 36" & 90" Meters cfs
1	4.71	2.3	117.70	59.3	122.41	61.6
2	0	0	202.63	102.2	202.63	102.2
3	0	0	199.97	100.8	199.97	100.8
4	0	0	199.26	100.5	199.26	100.5
5	44.69	22.5	107.12	54.0	151.81	76.5
6	101.15	51.0	0	0	101.15	51.0
7	101.15	51.0	0	0	101.15	51.0
8	101.15	51.0	0	0	101.15	51.0
9	101.15	51.0	0	0	101.15	51.0
10	101.15	51.0	0	0	101.15	51.0
11	101.15	51.0	0	0	101.15	51.0
12	101.15	51.0	0	0	101.15	51.0
13	101.15	51.0	0	0	101.15	51.0
14	101.15	51.0	0	0	101.15	51.0
15	101.15	51.0	0	0	101.15	51.0
16	101.15	51.0	0	0	101.15	51.0
17	101.14	51.0	0	0	101.14	51.0
18	101.14	51.0	0	0	101.14	51.0
19	101.14	51.0	0	0	101.14	51.0
20	101.14	51.0	0	0	101.14	51.0
21	101.14	51.0	0	0	101.14	51.0
22	101.14	51.0	0	0	101.14	51.0
23	101.14	51.0	0	0	101.14	51.0
24	101.14	51.0	0	0	101.14	51.0
25	101.14	51.0	0	0	101.14	51.0
26	101.14	51.0	0	0	101.14	51.0
27	101.14	51.0	0	0	101.14	51.0
28	25.96	13.1	0	0	25.96	13.1
29	0	0	0	0	0	0
30	0	0	0	0	0	0
31	-	-	-	-	-	-
Total	2,300.55	1,159.9	826.68	416.8	3,127.23	1,576.7

NONTRIBUTARY WATER FROM DEVIL CANYON POWERPLANT AFTERBAY (OC-59T) AS DISCHARGED TO M. W. D. RIALTO PIPELINE FROM 36" AND 90" VENTURI METERS

May, 1974

Day	36" Meter A.F.	36" Meter cfs	90" Meter A.F.	90" Meter cfs	Total From 36" & 90" Meters A.F.	Total From 36" & 90" Meters cfs
1	0	0	0	0	0	0
2	0	0	0	0	0	0
3	22.42	11.3	0	0	22.42	11.3
4	103.35	52.1	0	0	103.35	52.1
5	101.67	51.3	0	0	101.67	51.3
6	37.13	18.7	128.77	64.9	165.90	83.6
7	0	0	200.03	100.9	200.03	100.9
8	0	0	197.86	99.8	197.86	99.8
9	0	0	197.74	99.7	197.74	99.7
10	0	0	193.34	97.5	193.34	97.5
11	0	0	191.64	96.6	191.64	96.6
12	0	0	43.96	22.2	43.96	22.2
13	2.07	1.0	130.18	65.6	132.25	66.6
14	0	0	201.14	101.4	201.14	101.4
15	0	0	200.28	101.0	200.28	101.0
16	0	0	199.33	100.5	199.33	100.5
17	0	0	198.25	100.0	198.25	100.0
18	0	0	200.53	101.1	200.53	101.1
19	0	0	42.01	21.2	42.01	21.2
20	5.19	2.6	125.97	63.5	131.16	66.1
21	0	0	204.98	103.3	204.98	103.3
22	0	0	203.17	102.4	203.17	102.4
23	0	0	202.85	102.3	202.85	102.3
24	0	0	202.53	102.1	202.53	102.1
25	0	0	201.62	101.7	201.62	101.7
26	0	0	269.03	135.6	269.03	135.6
27	0	0	291.67	147.0	291.67	147.0
28	0	0	302.89	152.7	302.89	152.7
29	0	0	303.13	152.8	303.13	152.8
30	0	0	299.90	151.2	299.90	151.2
31	0	0	299.92	151.2	299.92	151.2
Total	271.83	137.0	5,232.72	2,638.2	5,504.55	2,775.2

NONTRIBUTARY WATER FROM DEVIL CANYON POWERPLANT AFTERBAY (OC-59T) AS DISCHARGED TO M.W.D. RIALTO PIPELINE FROM 36" AND 90" VENTURI METERS

June, 1974

Day	36" Meter A.F.	36" Meter cfs	90" Meter A.F.	90" Meter cfs	Total From 36" & 90" Meters A.F.	Total From 36" & 90" Meters cfs
1	0	0	296.02	149.2	296.02	149.2
2	0	0	86.96	43.8	86.96	43.8
3	2.46	1.3	188.95	95.3	191.41	96.6
4	0	0	302.63	152.6	302.63	152.6
5	0	0	302.63	152.6	302.63	152.6
6	0	0	302.63	152.6	302.63	152.6
7	0	0	302.63	152.6	302.63	152.6
8	0	0	302.63	152.6	302.63	152.6
9	0	0	302.63	152.6	302.63	152.6
10	0	0	302.64	152.5	302.64	152.5
11	0	0	302.64	152.5	302.64	152.5
12	0	0	80.76	40.7	80.76	40.7
13	0	0	0	0	0	0
14	5.78	2.9	176.16	88.8	181.94	91.7
15	0	0	303.47	153.0	303.47	153.0
16	0	0	87.41	44.1	87.41	44.1
17	3.42	1.7	183.36	92.4	186.78	94.1
18	0	0	301.61	152.1	301.61	152.1
19	0	0	301.61	152.1	301.61	152.1
20	0	0	301.61	152.1	301.61	152.1
21	0	0	301.61	152.1	301.61	152.1
22	0	0	301.61	152.1	301.61	152.1
23	0	0	301.61	152.1	301.61	152.1
24	0	0	301.62	152.1	301.62	152.1
25	0	0	301.62	152.1	301.62	152.1
26	0	0	301.62	152.1	301.62	152.1
27	0	0	301.62	152.0	301.62	152.0
28	0	0	301.62	152.0	301.62	152.0
29	0	0	301.62	152.0	301.62	152.0
30	0	0	305.63	154.1	305.63	154.1
31	-	-	-	-	-	-
Total	11.66	5.9	7,749.16	3,906.9	7,760.82	3,912.8

NONTRIBUTARY WATER FROM DEVIL CANYON POWER PLANT AFTER BAY (OC-59T) AS DISCHARGED TO M. W. D. RIALTO PIPELINE FROM 36" AND 90" VENTURI METERS

July, 1974

Day	36" Meter A. F.	36" Meter cfs	90" Meter A. F.	90" Meter cfs	Total From 36" & 90" Meters A. F.	Total From 36" & 90" Meters cfs
1	0	0	297.52	150.0	297.52	150.0
2	0	0	297.52	150.0	297.52	150.0
3	0	0	297.52	150.0	297.52	150.0
4	0	0	297.52	150.0	297.52	150.0
5	0	0	297.52	150.0	297.52	150.0
6	0	0	297.52	150.0	297.52	150.0
7	0	0	354.38	178.6	354.38	178.6
8	0	0	396.70	200.0	396.70	200.0
9	0	0	396.70	200.0	396.70	200.0
10	0	0	396.70	200.0	396.70	200.0
11	0	0	396.70	200.0	396.70	200.0
12	0	0	396.70	200.0	396.70	200.0
13	0	0	396.70	200.0	396.70	200.0
14	4.75	2.4	177.69	89.6	182.44	92.0
15	0	0	396.69	200.0	396.69	200.0
16	0	0	396.69	200.0	396.69	200.0
17	0	0	396.69	200.0	396.69	200.0
18	0	0	396.69	200.0	396.69	200.0
19	0	0	396.69	200.0	396.69	200.0
20	0	0	396.69	200.0	396.69	200.0
21	0	0	396.69	200.0	396.69	200.0
22	0	0	396.69	200.0	396.69	200.0
23	0	0	396.69	200.0	396.69	200.0
24	0	0	396.69	200.0	396.69	200.0
25	0	0	403.62	203.5	403.62	203.5
26	0	0	407.80	205.6	407.80	205.6
27	0	0	401.65	202.5	401.65	202.5
28	0	0	396.69	200.0	396.69	200.0
29	0	0	396.69	200.0	396.69	200.0
30	0	0	396.70	200.0	396.70	200.0
31	0	0	396.70	200.0	396.70	200.0
Total	4.75	2.4	11,464.14	5,779.8	11,468.89	5,782.2

TABLE NO. C-2

NONTRIBUTARY WATER FROM DEVIL CANYON POWERPLANT AFTERBAY (OC-59T) AS DISCHARGED TO M. W. D. RIALTO PIPELINE FROM 36" AND 90" VENTURI METERS

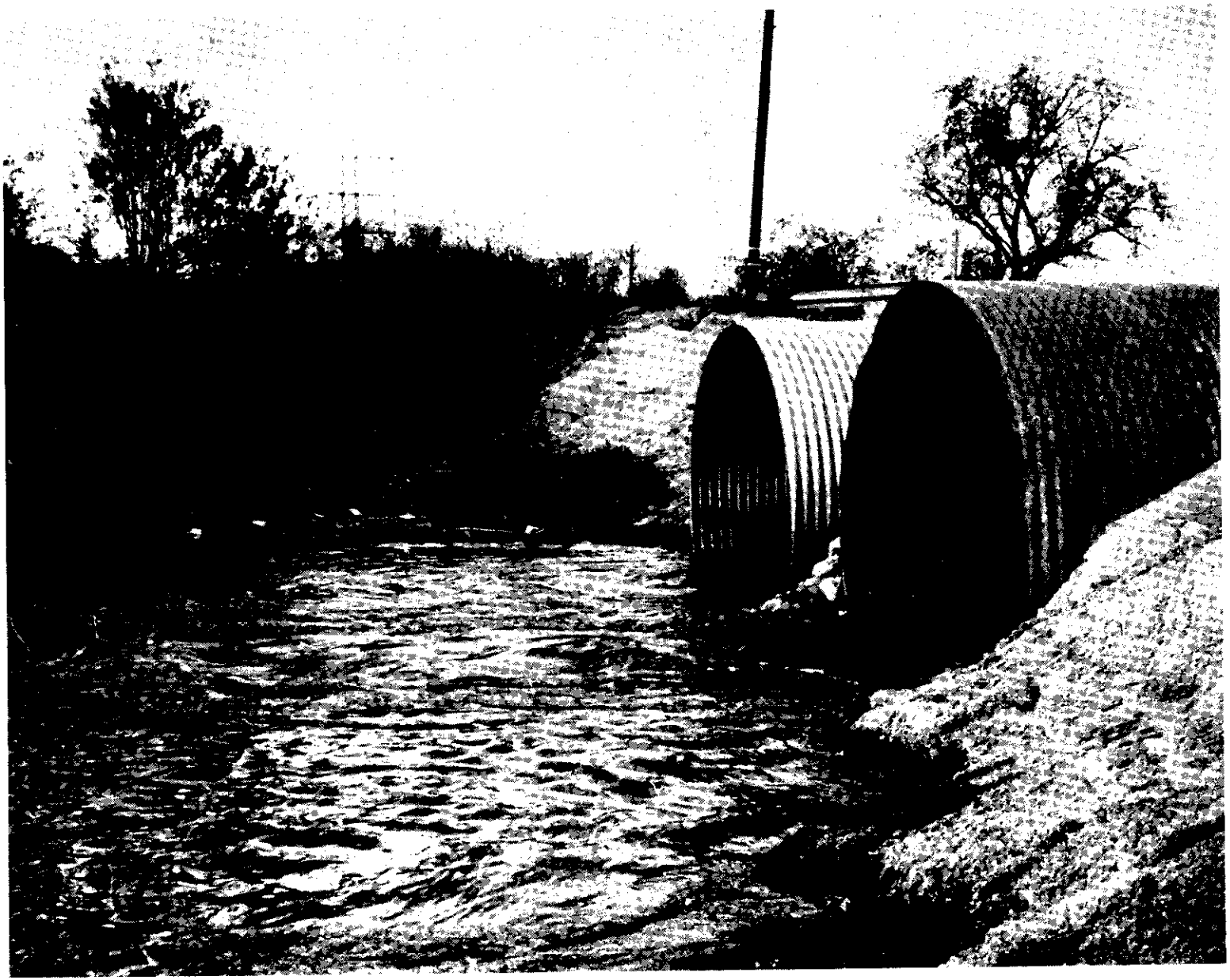
August, 1974

Day	36" Meter A.F.	36" Meter cfs	90" Meter A.F.	90" Meter cfs	Total From 36" & 90" Meters A.F.	Total From 36" & 90" Meters cfs
1	0	0	396.69	200.0	396.69	200.0
2	0	0	396.69	200.0	396.69	200.0
3	0	0	396.69	200.0	396.69	200.0
4	0	0	396.69	200.0	396.69	200.0
5	0	0	396.69	200.0	396.69	200.0
6	0	0	396.69	200.0	396.69	200.0
7	0	0	396.69	200.0	396.69	200.0
8	0	0	396.69	200.0	396.69	200.0
9	0	0	396.69	200.0	396.69	200.0
10	0	0	396.69	200.0	396.69	200.0
11	0	0	396.70	200.0	396.70	200.0
12	0	0	396.70	200.0	396.70	200.0
13	0	0	396.70	200.0	396.70	200.0
14	0	0	396.70	200.0	396.70	200.0
15	0	0	396.70	200.0	396.70	200.0
16	0	0	403.97	203.7	403.97	203.7
17	0	0	400.74	202.0	400.74	202.0
18	4.78	2.4	173.36	87.4	178.14	89.8
19	0	0	408.80	206.1	408.80	206.1
20	0	0	402.05	202.7	402.05	202.7
21	2.20	1.1	336.78	169.8	338.98	170.9
22	0	0	404.50	203.9	404.50	203.9
23	0	0	404.50	203.9	404.50	203.9
24	0	0	404.50	203.9	404.50	203.9
25	0	0	404.50	203.9	404.50	203.9
26	0	0	404.50	203.9	404.50	203.9
27	0	0	404.50	203.9	404.50	203.9
28	0	0	404.50	203.9	404.50	203.9
29	0	0	404.50	204.0	404.50	204.0
30	0	0	404.50	204.0	404.50	204.0
31	0	0	404.50	204.0	404.50	204.0
Total	6.98	3.5	12,121.10	6,111.0	12,128.08	6,114.5

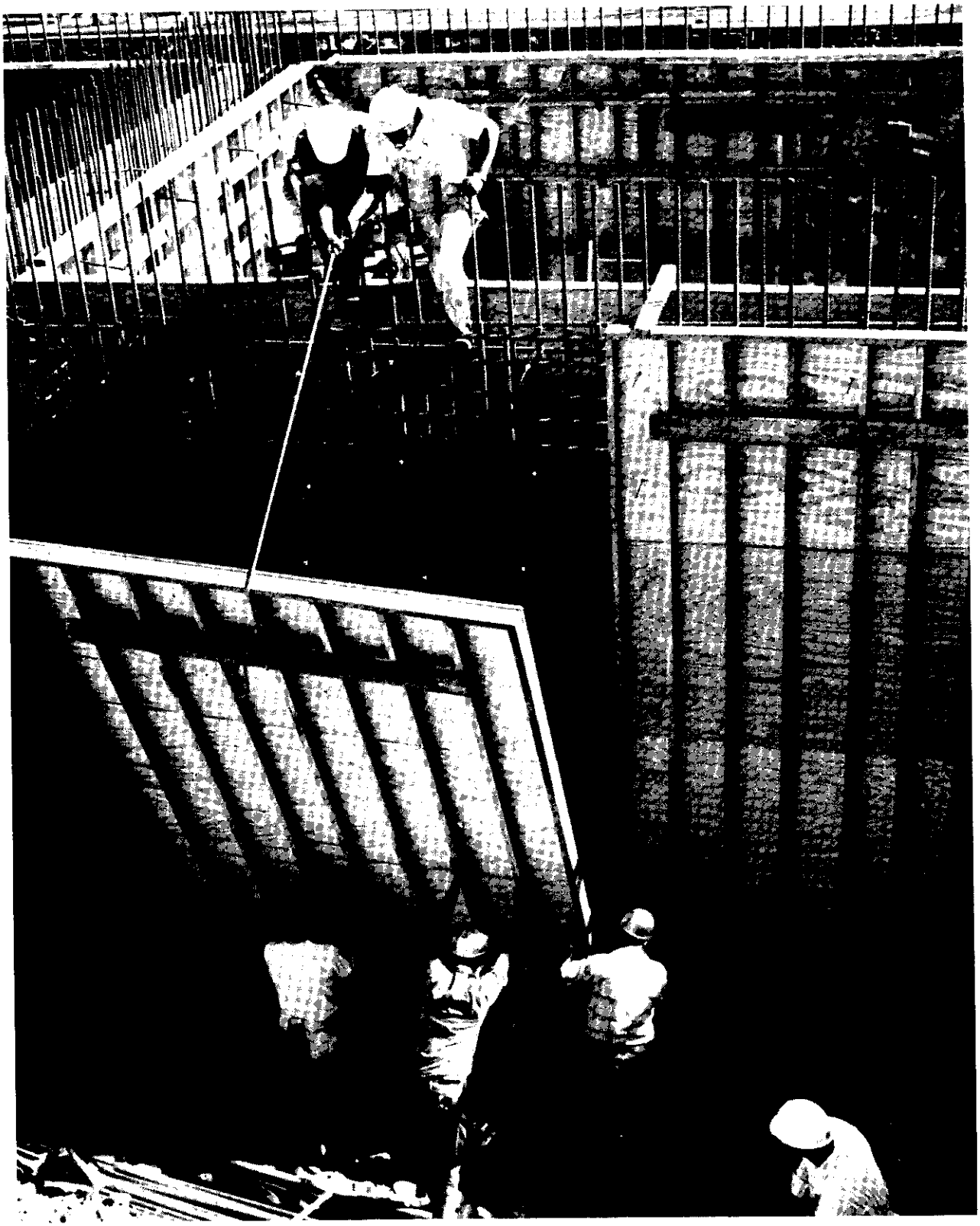
NONTRIBUTARY WATER FROM DEVIL CANYON POWERPLANT AFTERBAY (OC-59T) AS DISCHARGED TO M. W. D. RIALTO PIPELINE FROM 36" AND 90" VENTURI METERS

September, 1974

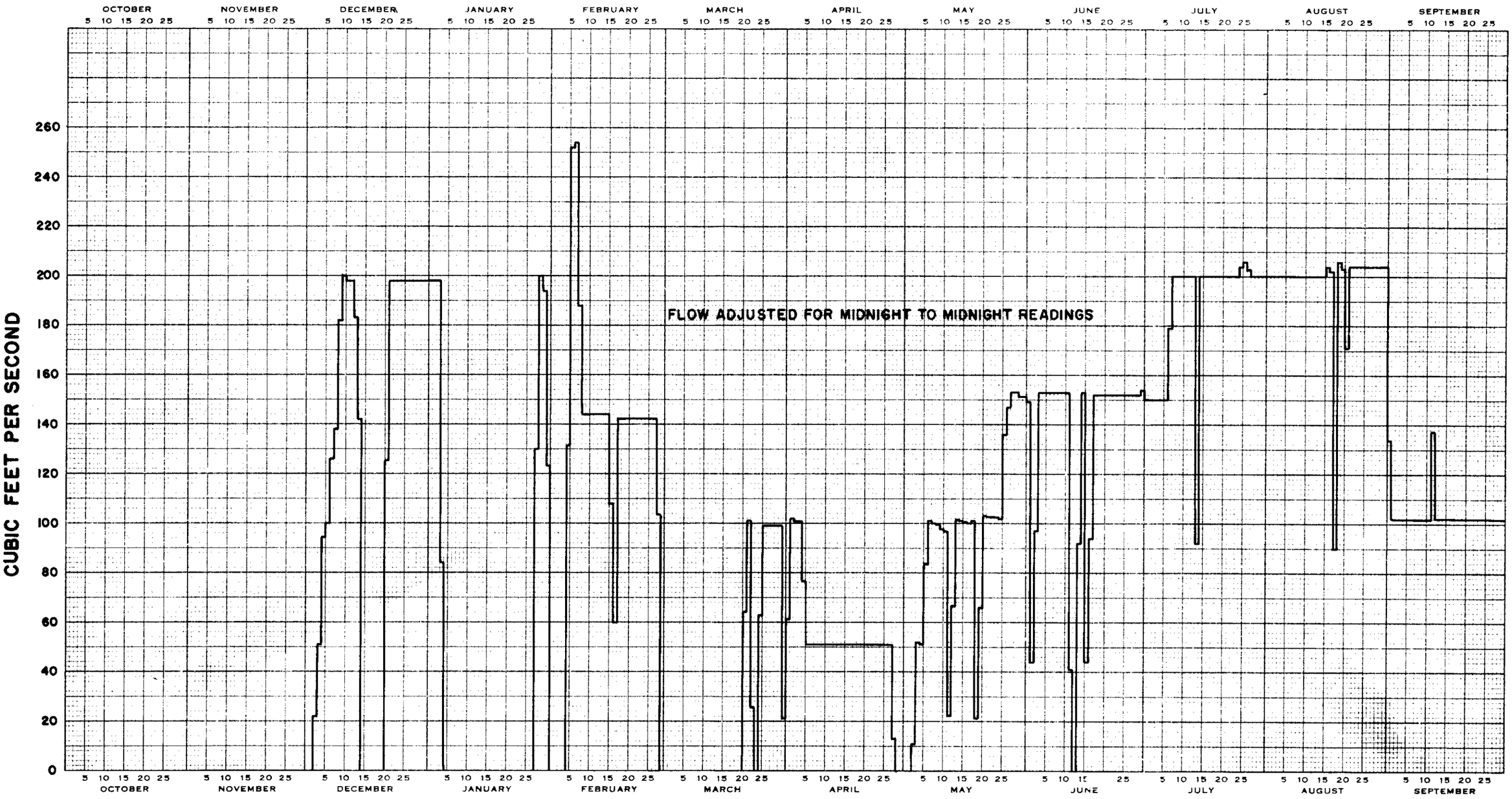
Day	36" Meter A. F.	36" Meter cfs	90" Meter A. F.	90" Meter cfs	Total From 36" & 90" Meters A. F.	Total From 36" & 90" Meters cfs
1	0	0	265.01	133.6	265.01	133.6
2	0	0	202.64	102.1	202.64	102.1
3	0	0	202.64	102.1	202.64	102.1
4	0	0	202.64	102.1	202.64	102.1
5	0	0	202.64	102.2	202.64	102.2
6	0	0	202.64	102.2	202.64	102.2
7	0	0	202.65	102.2	202.65	102.2
8	0	0	202.65	102.2	202.65	102.2
9	0	0	202.65	102.2	202.65	102.2
10	0	0	202.65	102.2	202.65	102.2
11	0	0	202.65	102.2	202.65	102.2
12	0	0	271.36	136.8	271.36	136.8
13	0	0	201.89	101.8	201.89	101.8
14	0	0	201.89	101.8	201.89	101.8
15	0	0	201.89	101.8	201.89	101.8
16	0	0	201.89	101.8	201.89	101.8
17	0	0	201.89	101.8	201.89	101.8
18	0	0	201.89	101.8	201.89	101.8
19	0	0	201.89	101.8	201.89	101.8
20	0	0	201.89	101.8	201.89	101.8
21	0	0	201.89	101.8	201.89	101.8
22	0	0	201.89	101.8	201.89	101.8
23	0	0	201.89	101.8	201.89	101.8
24	0	0	201.89	101.8	201.89	101.8
25	0	0	201.89	101.8	201.89	101.8
26	0	0	201.89	101.8	201.89	101.8
27	0	0	201.89	101.8	201.89	101.8
28	0	0	201.88	101.7	201.88	101.7
29	0	0	201.88	101.7	201.88	101.7
30	0	0	201.88	101.7	201.88	101.7
31	-	-	-	-	-	-
Total	0	0	6,196.81	3,124.2	6,196.81	3,124.2



Nontributary State Project water flowing in Chino Creek on entrance to Prado Flood Control Basin



Construction of Permanent Connection (OC 59) for
State Project Water Delivery into San Antonio Creek
located in Montclair - Taken in November 1974



NON-TRIBUTARY WATER RELEASED AT OC-59T FROM DEVIL CANYON POWERPLANT AFTERBAY TO M.W.D. RIALTO PIPELINE

PLATE C-1

APPENDIX D

WATER QUALITY OF SURFACE WATER FLOW OF SANTA ANA RIVER AT PRADO DAM

Prepared By

John M. Toups

1973-74

TABLE NO. D-1

U.S.G.S. WATER QUALITY SAMPLES
BELOW PRADO DAM
WATER YEAR 1973-74

Date	E.C.	T.D.S.	Date	E.C.	T.D.S.
Oct. 1973	1240	761	April 1974	585	356
	1300	806		941	556
	1210	742		945	566
	1220	748		931	564
				1180	724
Nov. 1973	1250	757			
	1190	730	May 1974	787	463
	1260	785		767	451
	1250	764		740	430
Dec. 1973	1210	745	June 1974	653	386
	714	426		663	376
	1170	706			
	685	400	July 1974	623	362
				569	336
Jan. 1974	767	464		583	346
	1050	629		559	325
	1230	735			
			Aug. 1974	554	329
Feb. 1974	662	483		558	337
	776	444		556	325
	773	452		569	326
				551	306
Mar. 1974	1150	674			
	1225	723	Sept. 1974	612	353
	680	393			
	1205	752			
	807	491			

TABLE D-2

WEIGHTED T.D.S. CALCULATION SHEET

BELOW PRADO DAM WATER YEAR 1973-1974 TDS= 0.62852160(EC)+ -23.846450

MONTH-DAY	U.S.G.S. MEAN DAILY FLOW (CFS-DAY)	U.S.G.S. MEAN DAILY SPECIFIC CONDUCTANCE (E.C.) (MICROMHOS)	MEAN DAILY ADJUSTED T.D.S. (PPM)	MEAN DAILY FL TIMES ADJUSTED T.D.
OCT 1	80.0	1240	756	60480.
OCT 2	128.0	1240	756	96768.
OCT 3	163.0	1245	759	123717.
OCT 4	184.0	1250	762	140208.
OCT 5	179.0	1260	768	137472.
OCT 6	155.0	1270	774	119970.
OCT 7	68.0	1280	781	53108.
OCT 8	54.0	1290	787	42498.
OCT 9	49.0	1295	790	38710.
OCT 10	50.0	1300	793	39650.
OCT 14	45.0	1255	765	34425.
OCT 11	54.0	1290	787	42498.
OCT 12	53.0	1280	781	41393.
OCT 13	48.0	1270	774	37152.
OCT 15	54.0	1240	756	40824.
OCT 16	52.0	1230	749	38948.
OCT 17	52.0	1220	743	38636.
OCT 18	53.0	1210	737	39061.
OCT 19	50.0	1210	737	36850.
OCT 20	56.0	1210	737	41272.
OCT 21	57.0	1215	740	42180.
OCT 22	64.0	1215	740	47360.
OCT 23	66.0	1220	743	49038.
OCT 24	67.0	1220	743	49781.
OCT 25	65.0	1220	743	48295.
OCT 26	63.0	1225	746	46998.
OCT 27	61.0	1225	746	45506.
OCT 28	59.0	1230	749	44191.
OCT 29	59.0	1230	749	44191.
OCT 30	54.0	1235	752	40608.
OCT 31	51.0	1235	752	38352.
TOTAL	2293.			1740140.
MONTHLY WEIGHTED T.D.S.			759	

TABLE D-2

WEIGHTED T.D.S. CALCULATION SHEET

BELOW PRADO DAM

WATER YEAR 1973-1974 TDS= 0.62852160(EC)+ -23.846450

MONTH-DAY	U.S.G.S. MEAN DAILY FLOW (CFS-DAY)	U.S.G.S. MEAN DAILY SPECIFIC CONDUCTANCE (E.C.) (MICROMHOS)	MEAN DAILY ADJUSTED T.D.S. (PPM)	MEAN DAILY FL(TIMES ADJUSTED T.D.S
NOV 1	53.0	1240	756	40068.
NOV 2	58.0	1240	756	43848.
NOV 3	55.0	1245	759	41745.
NOV 4	57.0	1245	759	43263.
NOV 5	61.0	1250	762	46482.
NOV 6	60.0	1250	762	45720.
NOV 7	59.0	1250	762	44958.
NOV 8	64.0	1250	762	48768.
NOV 9	63.0	1250	762	48006.
NOV 10	61.0	1250	762	46482.
NOV 11	65.0	1250	762	49530.
NOV 12	65.0	1250	762	49530.
NOV 13	64.0	1250	762	48768.
NOV 14	56.0	1250	762	42672.
NOV 15	74.0	1250	762	56388.
NOV 16	68.0	1260	768	52224.
NOV 17	78.0	1390	850	66300.
NOV 18	114.0	1411	863	98382.
NOV 19	110.0	1420	869	95590.
NOV 20	73.0	1280	781	57013.
NOV 21	114.0	1222	744	84816.
NOV 22	169.0	1260	768	129792.
NOV 23	165.0	1200	730	120450.
NOV 24	168.0	1120	680	114240.
NOV 25	150.0	1290	787	118050.
NOV 26	88.0	1291	788	69344.
NOV 27	76.0	1230	749	56924.
NOV 28	77.0	1250	762	58674.
NOV 29	105.0	1263	770	80850.
NOV 30	86.0	1290	787	67682.
TOTAL	2556.			1966559.
MONTHLY WEIGHTED T.D.S.			769	

TABLE D-2

WEIGHTED T.D.S. CALCULATION SHEET

BELOW PRADO DAM WATER YEAR 1973-1974 TDS= 0.62852160(EC)+ -23.646450

MONTH-DAY	U.S.G.S. MEAN DAILY FLOW (CFS-DAY)	U.S.G.S. MEAN DAILY SPECIFIC CONDUCTANCE (E.C.) (MICROMHOS)	MEAN DAILY ADJUSTED T.D.S. (PPM)	MEAN DAILY FL(TIMES ADJUSTED T.D.!
DEC 1	83.0	1270	774	64242.
DEC 2	96.0	1210	737	70752.
DEC 3	84.0	1230	749	62916.
DEC 4	84.0	1220	743	62412.
DEC 5	126.0	975	589	74214.
DEC 6	146.0	869	522	76212.
DEC 7	206.0	853	512	105472.
DEC 8	215.0	843	506	108790.
DEC 9	194.0	807	483	93702.
DEC 10	241.0	743	443	106763.
DEC 11	258.0	711	423	109134.
DEC 12	253.0	719	426	108284.
DEC 13	253.0	724	431	109043.
DEC 14	255.0	721	429	109395.
DEC 15	156.0	1170	712	111072.
DEC 16	93.0	1230	749	69657.
DEC 17	84.0	1250	762	64008.
DEC 18	84.0	1230	749	62916.
DEC 19	82.0	1210	737	60434.
DEC 20	84.0	1170	712	59808.
DEC 21	90.0	1170	712	64080.
DEC 22	259.0	1050	636	164724.
DEC 23	277.0	930	561	155397.
DEC 24	263.0	810	485	127555.
DEC 25	266.0	690	410	109060.
DEC 26	259.0	688	409	105931.
DEC 27	260.0	687	408	106080.
DEC 28	269.0	685	407	109483.
DEC 29	268.0	693	412	110416.
DEC 30	263.0	701	417	109671.
DEC 31	262.0	709	422	110564.
TOTAL	5813.			2962187.
MONTHLY WEIGHTED T.D.S.			510	

TABLE D-2

WEIGHTED T.D.S. CALCULATION SHEET

BELOW PRADO DAM WATER YEAR 1973-1974 TDS= 0.62852160(EC)+ -23.846450

MONTH-DAY	U.S.G.S. MEAN DAILY FLOW (CFS-DAY)	U.S.G.S. MEAN DAILY SPECIFIC CONDUCTANCE (E.C.) (MICROMHOS)	MEAN DAILY ADJUSTED T.D.S. (PPM)	MEAN DAILY FL(TIMES ADJUSTED T.D.S
JAN 1	297.0	713	424	125928.
JAN 2	281.0	717	427	119987.
JAN 3	275.0	692	411	113025.
JAN 4	395.0	699	415	163925.
JAN 5	755.0	767	458	345790.
JAN 6	730.0	689	409	298570.
JAN 7	760.0	610	360	273600.
JAN 8	1440.0	516	300	432000.
JAN 9	794.0	472	273	216762.
JAN 10	353.0	467	270	95310.
JAN 11	352.0	499	290	102080.
JAN 12	346.0	569	334	115564.
JAN 13	341.0	697	414	141174.
JAN 14	340.0	829	497	168980.
JAN 15	335.0	958	578	193630.
JAN 16	333.0	1040	630	209790.
JAN 17	328.0	1090	661	216808.
JAN 18	308.0	1140	693	213444.
JAN 19	288.0	1180	718	206784.
JAN 20	261.0	1160	705	184005.
JAN 21	227.0	1140	693	157311.
JAN 22	150.0	1200	730	109500.
JAN 23	104.0	1240	756	78624.
JAN 24	103.0	1230	749	77147.
JAN 25	102.0	1210	737	75174.
JAN 26	98.0	1200	730	71540.
JAN 27	94.0	1180	718	67492.
JAN 28	102.0	756	451	46002.
JAN 29	233.0	749	447	104151.
JAN 30	245.0	732	436	106820.
JAN 31	263.0	719	428	112564.
TOTAL	11033.			4943481.

MONTHLY WEIGHTED T.D.S. 448

TABLE D-2

WEIGHTED T.D.S. CALCULATION SHEET

BELOW PRADO DAM WATER YEAR 1973-1974 TDS= 0.62852160(EC)+ -23.846450

MONTH-DAY	U.S.G.S. MEAN DAILY FLOW (CFS-DAY)	U.S.G.S. MEAN DAILY SPECIFIC CONDUCTANCE (E.C.) (MICROMHOS)	MEAN DAILY ADJUSTED T.D.S. (PPM)	MEAN DAILY FL TIMES ADJUSTED T.D.
FEB 1	232.0	707	421	97672.
FEB 2	122.0	868	522	63684.
FEB 3	108.0	1029	623	67284.
FEB 4	106.0	1190	724	76744.
FEB 5	117.0	1170	712	83304.
FEB 6	272.0	685	407	110704.
FEB 7	308.0	679	403	124124.
FEB 8	292.0	705	419	122348.
FEB 9	245.0	769	459	112455.
FEB 10	244.0	758	453	110532.
FEB 11	244.0	755	451	110044.
FEB 12	245.0	763	456	111720.
FEB 13	244.0	775	463	112972.
FEB 14	248.0	773	462	114576.
FEB 15	248.0	775	463	114824.
FEB 16	220.0	808	484	106480.
FEB 17	204.0	857	515	105060.
FEB 18	196.0	835	501	98196.
FEB 19	245.0	758	453	110985.
FEB 20	243.0	757	452	109836.
FEB 21	238.0	759	453	107814.
FEB 22	241.0	767	458	110378.
FEB 23	243.0	775	463	112509.
FEB 24	237.0	774	463	109731.
FEB 25	234.0	764	456	106704.
FEB 26	237.0	767	458	108546.
FEB 27	234.0	768	459	107406.
FEB 28	239.0	788	471	112569.
TOTAL	6286.			2939201.
MONTHLY WEIGHTED T.D.S.			468	

TABLE D-2

WEIGHTED T.D.S. CALCULATION SHEET

BELOW PRADO DAM WATER YEAR 1973-1974 TDS= 0.62852160(EC)+ -23.846450

MONTH-DAY	U.S.G.S. MEAN DAILY FLOW (CFS-DAY)	U.S.G.S. MEAN DAILY SPECIFIC CONDUCTANCE (E.C.) (MICROMHOS)	MEAN DAILY ADJUSTED T.D.S. (PPM)	MEAN DAILY FL(TIMES ADJUSTED T.D.S
MAR 1	174.0	1068	647	112578.
MAR 2	203.0	905	545	110635.
MAR 3	231.0	853	512	118272.
MAR 4	227.0	949	573	130071.
MAR 5	181.0	1140	693	125433.
MAR 6	148.0	1230	749	110852.
MAR 7	141.0	1200	730	102930.
MAR 8	162.0	734	437	70794.
MAR 9	180.0	603	355	63900.
MAR 10	180.0	557	326	58680.
MAR 11	194.0	636	376	72944.
MAR 12	206.0	711	423	87138.
MAR 13	204.0	842	505	103020.
MAR 14	202.0	975	589	118978.
MAR 15	197.0	1050	636	125292.
MAR 16	195.0	1090	661	128895.
MAR 17	191.0	1150	699	133509.
MAR 18	187.0	1190	724	135388.
MAR 19	180.0	1170	712	128160.
MAR 20	166.0	1215	740	122840.
MAR 21	123.0	1220	743	91389.
MAR 22	153.0	856	514	78642.
MAR 23	162.0	839	503	81486.
MAR 24	150.0	1080	655	98250.
MAR 25	110.0	1140	693	76230.
MAR 26	146.0	813	487	71102.
MAR 27	156.0	803	481	75036.
MAR 28	209.0	791	473	98857.
MAR 29	231.0	840	504	116424.
MAR 30	210.0	848	509	106890.
MAR 31	191.0	873	525	100275.
TOTAL	5590.			3154890.
MONTHLY WEIGHTED T.D.S.			564	

TABLE D-2

WEIGHTED T.D.S. CALCULATION SHEET

BELOW PRADO DAM WATER YEAR 1973-1974 TDS= 0.62852160(EC)+ -23.846450

MONTH-DAY	U.S.G.S. MEAN DAILY FLOW (CFS-DAY)	U.S.G.S. MEAN DAILY SPECIFIC CONDUCTANCE (E.C.) (MICROMHOS)	MEAN DAILY ADJUSTED T.D.S. (PPM)	MEAN DAILY FL TIMES ADJUSTED T.D.
APR 1	110.0	1077	653	71830.
APR 2	235.0	678	402	94470.
APR 3	258.0	780	466	120228.
APR 4	213.0	846	508	108204.
APR 5	193.0	838	503	97079.
APR 6	140.0	941	568	79520.
APR 7	128.0	934	563	72064.
APR 8	119.0	925	558	66402.
APR 9	119.0	953	575	68425.
APR 10	123.0	954	576	70848.
APR 11	122.0	940	567	69174.
APR 12	120.0	928	559	67080.
APR 13	120.0	922	556	66720.
APR 14	117.0	910	548	64116.
APR 15	114.0	903	544	62016.
APR 16	116.0	913	550	63800.
APR 17	109.0	912	549	59841.
APR 18	112.0	922	556	62272.
APR 19	119.0	940	567	67473.
APR 20	128.0	930	561	71808.
APR 21	124.0	921	555	68820.
APR 22	127.0	915	551	69977.
APR 23	126.0	910	548	69048.
APR 24	126.0	925	558	70308.
APR 25	124.0	923	556	68944.
APR 26	129.0	918	553	71337.
APR 27	126.0	922	556	70056.
APR 28	117.0	908	547	63999.
APR 29	75.0	1120	680	51000.
APR 30	74.0	1140	693	51282.
TOTAL	3963.			2158141.
MONTHLY WEIGHTED T.D.S.			545	

TABLE D-2

WEIGHTED T.D.S. CALCULATION SHEET

BELOW PRADO DAM WATER YEAR 1973-1974 TDS= 0.62852160(EC)+ -23.846450

MONTH-DAY	U.S.G.S. MEAN DAILY FLOW (CFS-DAY)	U.S.G.S. MEAN DAILY SPECIFIC CONDUCTANCE (E.C.) (MICROMHOS)	MEAN DAILY ADJUSTED T.D.S. (PPM)	MEAN DAILY FL TIMES ADJUSTED T.D.
MAY 1	67.0	1170	712	47704.
MAY 2	68.0	1170	712	48416.
MAY 3	67.0	1160	705	47235.
MAY 4	95.0	1027	622	59090.
MAY 5	128.0	891	536	68608.
MAY 6	155.0	853	512	79360.
MAY 7	186.0	765	457	85002.
MAY 8	187.0	777	465	86955.
MAY 9	186.0	788	471	87606.
MAY 10	182.0	779	466	84812.
MAY 11	174.0	773	462	80388.
MAY 12	150.0	805	482	72300.
MAY 13	87.0	1049	635	55245.
MAY 14	172.0	745	444	76368.
MAY 15	173.0	741	442	76466.
MAY 16	168.0	751	448	75264.
MAY 17	165.0	740	441	72765.
MAY 18	162.0	733	437	70794.
MAY 19	142.0	770	460	65320.
MAY 20	77.0	1049	635	48895.
MAY 21	165.0	731	436	71940.
MAY 22	172.0	730	435	74820.
MAY 23	170.0	747	446	75820.
MAY 24	169.0	749	447	75543.
MAY 25	160.0	741	442	70720.
MAY 26	159.0	717	427	67893.
MAY 27	187.0	668	396	74052.
MAY 28	179.0	646	382	68378.
MAY 29	179.0	651	385	68915.
MAY 30	175.0	641	379	66325.
MAY 31	178.0	642	380	67640.
TOTAL	4684.			2170639.
MONTHLY WEIGHTED T.D.S.			463	

TABLE D-2

WEIGHTED T.D.S. CALCULATION SHEET

BELOW PRADO DAM WATER YEAR 1973-1974 TDS= 0.62852160(EC)+ -23.846450

MONTH-DAY	U.S.G.S. MEAN DAILY FLOW (CFS-DAY)	U.S.G.S. MEAN DAILY SPECIFIC CONDUCTANCE (E.C.) (MICROMHOS)	MEAN DAILY ADJUSTED T.D.S. (PPM)	MEAN DAILY FL TIMES ADJUSTED T.D.
JUN 1	183.0	653	387	70821.
JUN 2	159.0	716	426	67734.
JUN 3	76.0	1030	624	47424.
JUN 4	199.0	660	391	77809.
JUN 5	205.0	656	388	79540.
JUN 6	206.0	668	396	81576.
JUN 7	215.0	688	409	87935.
JUN 8	213.0	682	405	86265.
JUN 9	212.0	663	393	83316.
JUN 10	212.0	651	385	81620.
JUN 11	216.0	654	387	83592.
JUN 12	186.0	733	437	81282.
JUN 13	69.0	1100	668	46092.
JUN 14	70.0	1063	644	45080.
JUN 15	201.0	645	382	76782.
JUN 16	172.0	660	391	67252.
JUN 17	69.0	992	600	41400.
JUN 18	198.0	662	392	77616.
JUN 19	197.0	654	387	76239.
JUN 20	194.0	648	383	74302.
JUN 21	189.0	648	383	72387.
JUN 22	189.0	646	382	72198.
JUN 23	189.0	637	377	71253.
JUN 24	181.0	625	369	66789.
JUN 25	174.0	618	365	63510.
JUN 26	173.0	621	366	63318.
JUN 27	166.0	614	362	60092.
JUN 28	169.0	616	363	61347.
JUN 29	171.0	612	361	61731.
JUN 30	176.0	619	365	64240.
TOTAL	5229.			2090542.
MONTHLY WEIGHTED T.D.S.			400	

TABLE D-2

WEIGHTED T.D.S. CALCULATION SHEET

BELOW PRADO DAM WATER YEAR 1973-1974 TDS= 0.62852160(EC)+ -23.846450

MONTH-DAY	U.S.G.S. MEAN DAILY FLOW (CFS-DAY)	U.S.G.S. MEAN DAILY SPECIFIC CONDUCTANCE (E.C.) (MICROMHOS)	MEAN DAILY ADJUSTED T.D.S. (PPM)	MEAN DAILY FL TIMES ADJUSTED T.D.
JUL 1	179.0	617	364	65156.
JUL 2	181.0	608	358	64798.
JUL 3	184.0	606	357	65688.
JUL 4	179.0	601	354	63366.
JUL 5	178.0	595	350	62300.
JUL 6	176.0	595	350	61600.
JUL 7	184.0	586	344	63296.
JUL 8	207.0	565	331	68517.
JUL 9	209.0	565	331	69179.
JUL 10	212.0	564	331	70172.
JUL 11	217.0	568	333	72261.
JUL 12	216.0	564	331	71496.
JUL 13	216.0	557	326	70416.
JUL 14	175.0	612	361	63175.
JUL 15	176.0	663	393	69168.
JUL 16	217.0	562	329	71393.
JUL 17	217.0	548	321	69657.
JUL 18	215.0	544	318	68370.
JUL 19	219.0	546	319	69861.
JUL 20	218.0	541	316	68888.
JUL 21	208.0	540	316	65728.
JUL 22	203.0	543	317	64351.
JUL 23	209.0	548	321	67089.
JUL 24	209.0	547	320	66880.
JUL 25	213.0	555	325	69225.
JUL 26	217.0	553	324	70308.
JUL 27	216.0	534	312	67392.
JUL 28	215.0	546	319	68585.
JUL 29	218.0	547	320	69760.
JUL 30	228.0	558	327	74556.
JUL 31	230.0	562	329	75670.
TOTAL	6341.			2108301.

MONTHLY WEIGHTED T.D.S. 332

TABLE D-2

WEIGHTED T.D.S. CALCULATION SHEET

BELOW PRADO DAM WATER YEAR 1973-1974 TDS= 0.62852160(EC)+ -23.846450

MONTH-DAY	U.S.G.S. MEAN DAILY FLOW (CFS-DAY)	U.S.G.S. MEAN DAILY SPECIFIC CONDUCTANCE (E.C.) (MICROMHOS)	MEAN DAILY ADJUSTED T.D.S. (PPM)	MEAN DAILY FL(TIMES ADJUSTED T.D.
AUG 1	230.0	557	326	74980.
AUG 2	233.0	549	321	74793.
AUG 3	232.0	550	322	74704.
AUG 4	232.0	560	328	76096.
AUG 5	229.0	557	326	74654.
AUG 6	229.0	554	324	74196.
AUG 7	229.0	550	322	73738.
AUG 8	230.0	550	322	74060.
AUG 9	232.0	547	320	74240.
AUG 10	228.0	545	319	72732.
AUG 11	224.0	536	313	70112.
AUG 12	223.0	541	316	70468.
AUG 13	227.0	567	333	75591.
AUG 14	227.0	561	329	74683.
AUG 15	226.0	562	329	74354.
AUG 16	225.0	563	330	74250.
AUG 17	224.0	559	327	73248.
AUG 18	175.0	655	388	67900.
AUG 19	177.0	563	330	58410.
AUG 20	224.0	571	335	75040.
AUG 21	205.0	604	356	72980.
AUG 22	215.0	561	329	70735.
AUG 23	221.0	556	326	72046.
AUG 24	223.0	555	325	72475.
AUG 25	220.0	550	322	70840.
AUG 26	216.0	542	317	68472.
AUG 27	216.0	544	318	68688.
AUG 28	213.0	540	316	67308.
AUG 29	213.0	532	311	66243.
AUG 30	214.0	534	312	66768.
AUG 31	214.0	531	310	66340.
TOTAL	6826.			2221144.
MONTHLY WEIGHTED T.D.S.			325	

TABLE D-2

WEIGHTED T.D.S. CALCULATION SHEET

BELOW PRADO DAM WATER YEAR 1973-1974 TDS= 0.62852160(EC)+ -23.846450

MONTH-DAY	U.S.G.S. MEAN DAILY FLOW (CFS-DAY)	U.S.G.S. MEAN DAILY SPECIFIC CONDUCTANCE (E.C.) (MICROMHOS)	MEAN DAILY ADJUSTED T.D.S. (PPM)	MEAN DAILY FLOW TIMES ADJUSTED T.D.S
SEP 1	197.0	547	320	63040.
SEP 2	130.0	605	356	46280.
SEP 3	130.0	593	349	45370.
SEP 4	131.0	594	349	45719.
SEP 5	130.0	593	349	45370.
SEP 6	128.0	590	347	44416.
SEP 7	129.0	593	349	45021.
SEP 8	132.0	603	355	46860.
SEP 9	133.0	598	352	46816.
SEP 10	133.0	606	357	47481.
SEP 11	137.0	614	362	49594.
SEP 12	152.0	617	364	55328.
SEP 13	154.0	611	360	55440.
SEP 14	136.0	625	369	50184.
SEP 15	138.0	619	365	50370.
SEP 16	136.0	608	358	48688.
SEP 17	135.0	612	361	48735.
SEP 18	136.0	622	367	49912.
SEP 19	141.0	632	373	52593.
SEP 20	141.0	626	370	52170.
SEP 21	139.0	625	369	51291.
SEP 22	135.0	609	359	48465.
SEP 23	133.0	596	351	46683.
SEP 24	134.0	596	351	47034.
SEP 25	134.0	602	355	47570.
SEP 26	136.0	611	360	48960.
SEP 27	140.0	622	367	51380.
SEP 28	137.0	618	365	50005.
SEP 29	137.0	626	370	50690.
SEP 30	134.0	622	367	49178.
TOTAL	4138.			1480643.
MONTHLY WEIGHTED T.D.S.			358	

TABLE NO. D-3

SUMMARY OF WEIGHTED TDS
BELOW PRADO DAM
WATER YEAR 1973-74

	Monthly Flow cfs-day	Monthly Flow Times TDS	Monthly Weighted TDS
October	2,293	1,740,140	759
November	2,556	1,966,559	769
December	5,813	2,962,187	510
January	11,033	4,943,481	448
February	6,286	2,939,201	468
March	5,590	3,154,890	564
April	3,963	2,158,141	545
May	4,684	2,170,639	463
June	5,229	2,090,542	400
July	6,341	2,108,301	332
August	6,826	2,221,144	325
September	4,138	1,480,643	358
Total	64,752	29,935,868	
Yearly Weighted TDS			462

TABLE NO. D-4

SUMMARY OF WEIGHTED TDS
OF
NONTRIBUTARY WATER RELEASED FROM OC-59T
FOR
WATER YEAR 1973-74

	Monthly Flow cfs-day	Monthly Flow Times TDS	Monthly Weighted TDS
October	0	0	0
November	0	0	0
December	3,732	824,707	221
January	1,322	265,390	201
February	3,699	747,337	202
March	771	158,950	206
April	1,577	336,621	213
May	2,775	620,914	224
June	3,913	916,638	234
July	5,782	1,247,799	216
August	6,114	1,357,600	222
September	3,124	667,027	214
Total	32,809	7,142,983	
Yearly Weighted TDS			218

APPENDIX E

WATER QUALITY OF SURFACE WATER FLOW OF SANTA ANA RIVER AT RIVERSIDE NARROWS
and
WATER QUALITY OF THE RIVERSIDE WATER QUALITY CONTROL PLANT AT RIVERSIDE NARROWS

by

Albert A. Webb

1973-74

TABLE NO. E-1

U.S.G.S. WATER QUALITY SAMPLES
M.W.D. CROSSING
WATER YEAR 1973-74

Date	E.C.	T.D.S.
1973 October	1120	687
	1090	681
	1100	681
	1110	675
November	1080	670
	1090	673
	1120	688
	1110	706
December	1090	688
	1090	676
	1090	658
	1080	666
1974 January	1040	636
	297	190
	882	533
	1110	690
February	1100	772
	1140	702
	1080	659
	1100	668
March	1090	658
	1110	660
	1080	673
	1070	669
April	1100	680
	1100	680
	1090	682
	1100	689
	1100	691
May	1080	670
	1100	677
	1100	681
	1090	695
June	1090	677
	1090	682
	1100	680
	1100	676
July	1100	674
	1100	701
	1100	701
	1100	691
August	1090	695
	1100	698
	1100	689
	1090	685
	1100	683
September	1090	673
	1110	703
	1090	704
	1110	707

TABLE NO. E-2

WEIGHTED T.D.S. CALCULATION SHEET

M.W.D. CROSSING

WATER YEAR 1973-74

$$T.D.S. = \frac{EC}{0.000051(EC)+1.549790}$$

Month-Day	U.S.G.S. Mean Daily Flow (cfs-Day)	Storm Flow (cfs-Day)	Base Flow (cfs-Day)	U.S.G.S. Mean Daily Specific Conductance (E.C.) (Micromhos)	Mean Daily Adjusted T.D.S. (PPM)	Adjusted T.D.S. Times Mean Daily Flow: U.S.G.S. Total Flow	Storm Flow	Base Flow
OCT 1	19.0	0.0	19.0	1120	697	13243.	0.	13243.
OCT 2	21.0	0.0	21.0	1080	673	14133.	0.	14133.
OCT 3	20.0	0.0	20.0	1080	673	13460.	0.	13460.
OCT 4	19.0	0.0	19.0	1090	679	12901.	0.	12901.
OCT 5	21.0	0.0	21.0	1080	673	14133.	0.	14133.
OCT 6	21.0	0.0	21.0	1060	661	13861.	0.	13861.
OCT 7	22.0	0.0	22.0	1090	679	14938.	0.	14938.
OCT 8	21.0	0.0	21.0	1090	679	14259.	0.	14259.
OCT 9	22.0	0.0	22.0	1070	667	14674.	0.	14674.
OCT 10	21.0	0.0	21.0	1080	673	14133.	0.	14133.
OCT 11	21.0	0.0	21.0	1090	679	14259.	0.	14259.
OCT 12	21.0	0.0	21.0	1110	691	14511.	0.	14511.
OCT 13	21.0	0.0	21.0	1110	691	14511.	0.	14511.
OCT 14	21.0	0.0	21.0	1110	691	14511.	0.	14511.
OCT 15	21.0	0.0	21.0	1100	685	14385.	0.	14385.
OCT 16	21.0	0.0	21.0	1110	691	14511.	0.	14511.
OCT 17	19.0	0.0	19.0	1100	685	13015.	0.	13015.
OCT 18	19.0	0.0	19.0	1110	691	13129.	0.	13129.
OCT 19	19.0	0.0	19.0	1100	685	13015.	0.	13015.
OCT 20	20.0	0.0	20.0	1090	679	13580.	0.	13580.
OCT 21	20.0	0.0	20.0	1090	679	13580.	0.	13580.
OCT 22	20.0	0.0	20.0	1090	679	13580.	0.	13580.
OCT 23	21.0	0.0	21.0	1070	667	14007.	0.	14007.
OCT 24	21.0	0.0	21.0	1060	661	13861.	0.	13861.
OCT 25	21.0	0.0	21.0	1060	661	13861.	0.	13861.
OCT 26	21.0	0.0	21.0	1060	661	13881.	0.	13881.
OCT 27	20.0	0.0	20.0	1070	667	13340.	0.	13340.
OCT 28	20.0	0.0	20.0	1090	679	13580.	0.	13580.
OCT 29	22.0	0.0	22.0	1070	667	14674.	0.	14674.
OCT 30	19.0	0.0	19.0	1070	667	12673.	0.	12673.
OCT 31	19.0	0.0	19.0	1060	661	12559.	0.	12559.
TOTAL	634.	0.	634.			428818.	0.	428818.
MONTHLY WEIGHTED T.D.S.					676			

TABLE NO. E-2

WEIGHTED T.D.S. CALCULATION SHEET

M.W.D. CROSSING

WATER YEAR 1973-74

$$T.D.S. = \frac{EC}{0.000051(EC)+1.549790}$$

Month-Day	U.S.G.S. Mean Daily Flow (cfs-Day)	Storm Flow (cfs-Day)	Base Flow (cfs-Day)	U.S.G.S. Mean Daily Specific Conductance (E.C.) (Micromhos)	Mean Daily Adjusted T.D.S. (PPM)		Adjusted T.D.S. Times Mean Daily Flow: U.S.G.S. Total Flow	Storm Flow	Base Flow
NOV 1	20.0	0.0	20.0	1080	673		13460.	0.	13460.
NOV 2	20.0	0.0	20.0	1070	667		13340.	0.	13340.
NOV 3	20.0	0.0	20.0	1090	679		13580.	0.	13580.
NOV 4	21.0	0.0	21.0	1060	673		14133.	0.	14133.
NOV 5	21.0	0.0	21.0	1070	667		14007.	0.	14007.
NOV 6	20.0	0.0	20.0	1060	661		13220.	0.	13220.
NOV 7	21.0	0.0	21.0	1060	661		13881.	0.	13881.
NOV 8	22.0	0.0	22.0	1060	661		14542.	0.	14542.
NOV 9	23.0	0.0	23.0	1070	667		15341.	0.	15341.
NOV 10	22.0	0.0	22.0	1060	661		14542.	0.	14542.
NOV 11	23.0	0.0	23.0	1070	667		15341.	0.	15341.
NOV 12	22.0	0.0	22.0	1060	661		14542.	0.	14542.
NOV 13	22.0	0.0	22.0	1060 (1)	661		14542.	0.	14542.
NOV 14	23.0	0.0	23.0	1060	661		15203.	0.	15203.
NOV 15	22.0	0.0	22.0	1060	661		14542.	0.	14542.
NOV 16	21.0	0.0	21.0	1052 (1)	656		13776.	0.	13776.
NOV 17	27.0	5.8	21.2	1045 (1)	652	665*	17604.	3506.	14098.
NOV 18	90.0	68.6	21.4	1038 (1)	648	665*	58320.	44099.	14231.
NOV 19	43.0	21.5	21.5	1030	643	665*	27649.	13351.	14298.
NOV 20	32.0	10.3	21.7	1090	679	665*	21728.	7298.	14430.
NOV 21	32.0	10.1	21.9	1110	691	665*	22112.	7548.	14564.
NOV 22	33.0	10.9	22.1	1110	691	665*	22803.	8106.	14697.
NOV 23	79.0	56.7	22.3	835	524	665*	41396.	26566.	14830.
NOV 24	34.0	11.5	22.5	1030	673	665*	22882.	7919.	14963.
NOV 25	32.0	9.4	22.6	1080	673	665*	21536.	6507.	15029.
NOV 26	29.0	6.2	22.8	1090	679	665*	19691.	4529.	15162.
NOV 27	23.0	0.0	23.0	1080	673		15479.	0.	15479.
NOV 28	23.0	0.0	23.0	1070	667		15341.	0.	15341.
NOV 29	23.0	0.0	23.0	1060	661		15203.	0.	15203.
NOV 30	23.0	0.0	23.0	1050	655		15065.	0.	15065.
TOTAL	866.	211.0	655.0				564801.	179419.	435382.
MONTHLY WEIGHTED T.D.S.					652				

(1) Daily mean E.C. not recorded by U.S.G.S., E.C. estimated by interpolation.
*Adjusted T.D.S., for Base Flow, calculated by averaging the T.D.S. on the day before and the day after Storm Flow.

TABLE NO. E-2

WEIGHTED T.D.S. CALCULATION SHEET

M.W.D. CROSSING

WATER YEAR 1973-74

$$T.D.S. = \frac{EC}{0.000051(EC)+1.549790}$$

Month-Day	U.S.G.S. Mean Daily Flow (cfs-Day)	Storm Flow (cfs-Day)	Base Flow (cfs-Day)	U.S.G.S. Mean Daily Specific Conductance (E.C.) (Micromhos)	Mean Daily Adjusted T.D.S. (PPM)		Adjusted T.D.S. Times Mean Daily Flow: U.S.G.S. Total Flow	Storm Flow	Base Flow
DEC 1	27.0	4.0	23.0	1055 (1)	658	658 *	17766.	2632.	15134.
DEC 2	23.0	0.0	23.0	1060	661		15203.	0.	15203.
DEC 3	22.0	0.0	22.0	1090	679		14938.	0.	14938.
DEC 4	22.0	0.0	22.0	1070	667		14674.	0.	14674.
DEC 5	22.0	0.0	22.0	1060	661		14542.	0.	14542.
DEC 6	22.0	0.0	22.0	1080	673		14806.	0.	14806.
DEC 7	23.0	0.0	23.0	1080	673		15479.	0.	15479.
DEC 8	22.0	0.0	22.0	1070	667		14674.	0.	14674.
DEC 9	21.0	0.0	21.0	1077 (1)	671		14091.	0.	14091.
DEC 10	22.0	0.0	22.0	1083 (1)	675		14850.	0.	14850.
DEC 11	23.0	0.0	23.0	1090	679		15617.	0.	15617.
DEC 12	22.0	0.0	22.0	1088 (1)	678		14916.	0.	14916.
DEC 13	22.0	0.0	22.0	1086 (1)	677		14894.	0.	14894.
DEC 14	23.0	0.0	23.0	1083 (1)	675		15525.	0.	15525.
DEC 15	23.0	0.0	23.0	1081 (1)	674		15502.	0.	15502.
DEC 16	23.0	0.0	23.0	1079 (1)	672		15456.	0.	15456.
DEC 17	23.0	0.0	23.0	1077 (1)	671		15433.	0.	15433.
DEC 18	23.0	0.0	23.0	1074 (1)	669		15387.	0.	15387.
DEC 19	23.0	0.0	23.0	1072 (1)	668		15364.	0.	15364.
DEC 20	24.0	0.0	24.0	1070	667		16008.	0.	16008.
DEC 21	25.0	0.0	25.0	1090	679		16975.	0.	16975.
DEC 22	24.0	0.0	24.0	1080	673		16152.	0.	16152.
DEC 23	24.0	0.0	24.0	1060	661		15864.	0.	15864.
DEC 24	24.0	0.0	24.0	1090	679		16296.	0.	16296.
DEC 25	24.0	0.0	24.0	1110	691		16584.	0.	16584.
DEC 26	24.0	0.0	24.0	1070	667		16008.	0.	16008.
DEC 27	24.0	0.0	24.0	1060	661		15864.	0.	15864.
DEC 28	28.0	0.0	28.0	1080	673		18844.	0.	18844.
DEC 29	24.0	0.0	24.0	1080	673		16152.	0.	16152.
DEC 30	24.0	0.0	24.0	1090	679		16296.	0.	16296.
DEC 31	23.0	0.0	23.0	1070	667		15341.	0.	15341.
TOTAL	723.	4.0	719.0				485501.	2632.	482869.
MONTHLY WEIGHTED T.D.S.					672				

(1) Daily mean E.C. not recorded by U.S.G.S., E.C. estimated by interpolation.
*Adjusted T.D.S., for Base Flow, calculated by averaging the T.D.S. on the day before and the day after Storm Flow.

TABLE NO. E-2

WEIGHTED T.D.S. CALCULATION SHEET

M.W.D. CROSSING

WATER YEAR 1973-74

$$T.D.S. = \frac{EC}{0.000051(EC)+1.549790}$$

Month-Day	U.S.G.S. Mean Daily Flow (cfs-Day)	Storm Flow (cfs-Day)	Base Flow (cfs-Day)	U.S.G.S. Mean Daily Specific Conductance (E.C.) (Micromhos)	Mean Daily Adjusted T.D.S. (PPM)		Adjusted T.D.S. Times Mean Daily Flow: U.S.G.S. Total Flow	Storm Flow	Base Flow
JAN 1	39.0	15.9	23.1	1040 (1)	649	667 *	25311.	903.	15408.
JAN 2	28.0	4.7	23.3	1010	631	667 *	17668.	2127.	15541.
JAN 3	25.0	1.6	23.4	1010 (1)	631	667 *	15775.	167.	15608.
JAN 4	663.0	639.4	23.6	402	256	667 *	169726.	153987.	15741.
JAN 5	476.0	452.3	23.7	452	287	667 *	136612.	120804.	15808.
JAN 6	71.0	47.1	23.9	807	507	667 *	35997.	20056.	15941.
JAN 7	999.0	975.0	24.0	392	250	667 *	249750.	233742.	16008.
JAN 8	900.0	875.9	24.1	508	322	667 *	289800.	273725.	16075.
JAN 9	68.0	43.7	24.3	776	488	667 *	33184.	16976.	16208.
JAN 10	61.0	36.6	24.4	757	477	667 *	29097.	12822.	16275.
JAN 11	64.0	39.4	24.6	718	453	667 *	28992.	12584.	16408.
JAN 12	51.0	26.3	24.7	837	526	667 *	26826.	10351.	16475.
JAN 13	48.0	23.1	24.9	958	599	667 *	28752.	12144.	16608.
JAN 14	49.0	24.0	25.0	1010	631	667 *	30919.	14244.	16675.
JAN 15	40.0	14.9	25.1	1070	667	667 *	26650.	9938.	16742.
JAN 16	38.0	12.7	25.3	1060	661	667 *	25118.	8243.	16875.
JAN 17	40.0	14.6	25.4	996	622	667 *	24880.	7938.	16942.
JAN 18	35.0	9.4	25.6	1070	667	667 *	23345.	6270.	17075.
JAN 19	31.0	5.3	25.7	1080	673	667 *	20863.	3721.	17142.
JAN 20	31.0	5.1	25.9	1040	649	667 *	20119.	2844.	17275.
JAN 21	26.0	0.0	26.0	1070	667		17342.	0.	17342.
JAN 22	24.0	0.0	24.0	1060	661		15864.	0.	15864.
JAN 23	24.0	0.0	24.0	1050	655		15720.	0.	15720.
JAN 24	24.0	0.0	24.0	1070	667		16008.	0.	16008.
JAN 25	27.0	0.0	27.0	1090	679		18333.	0.	18333.
JAN 26	30.0	0.0	30.0	1080	673		20190.	0.	20190.
JAN 27	32.0	0.0	32.0	1090	679		21728.	0.	21728.
JAN 28	34.0	0.0	34.0	1110	691		23494.	0.	23494.
JAN 29	33.0	0.0	33.0	1130	703		23199.	0.	23199.
JAN 30	33.0	0.0	33.0	1150	715		23595.	0.	23595.
JAN 31	31.0	0.0	31.0	1140	709		21979.	0.	21979.
TOTAL	4075.	3267.0	808.0				1476868.	932586.	544282.
MONTHLY WEIGHTED T.D.S.					362				

(1) Daily mean E.C. not recorded by U.S.G.S., E.C. estimated by interpolation.
*Adjusted T.D.S., for Base Flow, calculated by averaging the T.D.S. on the day before and the day after Storm Flow.

TABLE NO. E-2

WEIGHTED T.D.S. CALCULATION SHEET

M.W.D. CROSSING

WATER YEAR 1973-74

$$T.D.S. = \frac{EC}{0.000051(EC)+1.549790}$$

Month-Day	U.S.G.S. Mean Daily Flow (cfs-Day)	Storm Flow (cfs-Day)	Base Flow (cfs-Day)	U.S.G.S. Mean Daily Specific Conductance (E.C.) (Micromhos)	Mean Daily Adjusted T.D.S. (PPM)		Adjusted T.D.S. Times Mean Daily Flow: U.S.G.S. Total Flow	Adjusted T.D.S. Times Mean Daily Flow: Storm Flow	Adjusted T.D.S. Times Mean Daily Flow: Base Flow
FEB 1	37.0	0.0	37.0	1140	709		26233.	0.	26233.
FEB 2	34.0	0.0	34.0	1110	691		23494.	0.	23494.
FEB 3	31.0	0.0	31.0	1120	697		21607.	0.	21607.
FEB 4	31.0	0.0	31.0	1100	685		21235.	0.	21235.
FEB 5	31.0	0.0	31.0	1080	673		20863.	0.	20863.
FEB 6	30.0	0.0	30.0	1050	655		19650.	0.	19650.
FEB 7	29.0	0.0	29.0	1070	667		19343.	0.	19343.
FEB 8	31.0	0.0	31.0	1070	667		20677.	0.	20677.
FEB 9	32.0	0.0	32.0	1070	667		21344.	0.	21344.
FEB 10	32.0	0.0	32.0	1065(1)	664		21248.	0.	21248.
FEB 11	32.0	0.0	32.0	1060	661		21152.	0.	21152.
FEB 12	33.0	0.0	33.0	1070	667		22011.	0.	22011.
FEB 13	33.0	0.0	33.0	1080	673		22209.	0.	22209.
FEB 14	42.0	0.0	42.0	1100	685		28770.	0.	28770.
FEB 15	35.0	0.0	35.0	1070	667		23345.	0.	23345.
FEB 16	34.0	0.0	34.0	1060	661		22474.	0.	22474.
FEB 17	36.0	0.0	36.0	1053(1)	657		23652.	0.	23652.
FEB 18	34.0	0.0	34.0	1047(1)	653		22202.	0.	22202.
FEB 19	34.0	0.0	34.0	1040	649		22066.	0.	22066.
FEB 20	32.0	0.0	32.0	1060	661		21152.	0.	21152.
FEB 21	31.0	0.0	31.0	1050	655		20305.	0.	20305.
FEB 22	32.0	0.0	32.0	1050(1)	655		20960.	0.	20960.
FEB 23	34.0	0.0	34.0	1050	655		22270.	0.	22270.
FEB 24	30.0	0.0	30.0	1060	661		19830.	0.	19830.
FEB 25	29.0	0.0	29.0	1060	661		19169.	0.	19169.
FEB 26	30.0	0.0	30.0	1075(1)	670		20100.	0.	20100.
FEB 27	30.0	0.0	30.0	1090	679		20370.	0.	20370.
FEB 28	44.0	13.8	30.2	1010	631	685*	27764.	7077.	20687.
TOTAL	923.	13.8	909.2				615495.	7077.	608418.
MONTHLY WEIGHTED T.D.S.					667				

(1) Daily mean E.C. not recorded by U.S.G.S., E.C. estimated by interpolation.
*Adjusted T.D.S., for Base Flow, calculated by averaging the T.D.S. on the day before and the day after Storm Flow.

TABLE NO. E-2

WEIGHTED T.D.S. CALCULATION SHEET

M.W.D. CROSSING

WATER YEAR 1973-74

$$T.D.S. = \frac{EC}{0.000051(EC)+1.549790}$$

Month-Day	U.S.G.S. Mean Daily Flow (cfs-Day)	Storm Flow (cfs-Day)	Base Flow (cfs-Day)	U.S.G.S. Mean Daily Specific Conductance (E.C.) (Micromhos)	Mean Daily Adjusted T.D.S. (PPM)		Adjusted T.D.S. Times Mean Daily Flow: U.S.G.S. Total Flow	Storm Flow	Base Flow
MAR 1	38.0	7.7	30.3	1110	691	685	26258.	5502.	20756.
MAR 2	129.0	98.5	30.5	756	476	685	61404.	40511.	20893.
MAR 3	49.0	18.3	30.7	794	499	685	24451.	3421.	21030.
MAR 4	35.0	4.2	30.8	1070	667	685	23345.	2247.	21098.
MAR 5	28.0	0.0	28.0	960	613		17164.	0.	17164.
MAR 6	31.0	0.0	31.0	1020	637		19747.	0.	19747.
MAR 7	44.0	12.7	31.3	989	618	685	27192.	5751.	21441.
MAR 8	421.0	389.5	31.5	266	170	685	71570.	49992.	21578.
MAR 9	46.0	14.3	31.7	1050 (1)	655	685	30130.	8415.	21715.
MAR 10	36.0	4.2	31.8	1080 (1)	673	685	24228.	2445.	21783.
MAR 11	32.0	0.0	32.0	1110	691		22112.	0.	22112.
MAR 12	32.0	0.0	32.0	1080	673		21536.	0.	21536.
MAR 13	31.0	0.0	31.0	1070	667		20677.	0.	20677.
MAR 14	32.0	0.0	32.0	1080	673		21536.	0.	21536.
MAR 15	33.0	0.0	33.0	1090	679		22407.	0.	22407.
MAR 16	33.0	0.0	33.0	1100	685		22605.	0.	22605.
MAR 17	31.0	0.0	31.0	1100	685		21235.	0.	21235.
MAR 18	32.0	0.0	32.0	1100	685		21920.	0.	21920.
MAR 19	31.0	0.0	31.0	1080	673		20863.	0.	20863.
MAR 20	29.0	0.0	29.0	1080	673		19517.	0.	19517.
MAR 21	29.0	0.0	29.0	1080	673		19517.	0.	19517.
MAR 22	30.0	0.0	30.0	1060	661		19830.	0.	19830.
MAR 23	30.0	0.0	30.0	1040	649		19470.	0.	19470.
MAR 24	31.0	0.0	31.0	1040(1)	649		20119.	0.	20119.
MAR 25	32.0	0.0	32.0	1040	649		20768.	0.	20768.
MAR 26	32.0	0.0	32.0	1090	679		21728.	0.	21728.
MAR 27	33.0	0.0	33.0	1030	643		21219.	0.	21219.
MAR 28	34.0	0.0	34.0	1060	661		22474.	0.	22474.
MAR 29	42.0	8.4	33.6	1040	649	664*	27258.	4948.	22310.
MAR 30	43.0	9.9	33.1	1030	643	664*	27649.	5671.	21978.
MAR 31	43.0	10.3	32.7	988	617	664*	26531.	4818.	21713.
TOTAL	1552.	578.0	974.0				786460.	143721.	652799.
MONTHLY WEIGHTED T.D.S.					507				

(1) Daily mean E.C. not recorded by U.S.G.S., E.C. estimated by interpolation.
*Adjusted T.D.S., for Base Flow, calculated by averaging the T.D.S. on the day before and the day after Storm Flow.

TABLE NO. E-2

WEIGHTED T.D.S. CALCULATION SHEET

M.W.D. CROSSING

WATER YEAR 1973-74

$$T.D.S. = \frac{EC}{0.000051(EC)+1.549790}$$

Month-Day	U.S.G.S. Mean Daily Flow (cfs-Day)	Storm Flow (cfs-Day)	Base Flow (cfs-Day)	U.S.G.S. Mean Daily Specific Conductance (E.C.) (Micromhos)	Mean Daily Adjusted T.D.S. (PPM)		Adjusted T.D.S. Times Mean Daily Flow: U.S.G.S. Total Flow	Storm Flow	Base Flow
APR 1	36.0	3.8	32.2	1060	661	664 *	23796.	2415.	21381.
APR 2	77.0	45.2	31.8	571	362	664 *	27874.	6759.	21115.
APR 3	37.0	5.7	31.3	820(1)	515	590(2)	19055.	588.	18467.
APR 4	36.0	5.1	30.9	1070	667	664 *	24012.	3494.	20518.
APR 5	34.0	3.6	30.4	1040	649	664 *	22066.	1880.	20186.
APR 6	30.0	0.0	30.0	1070	667		20010.	0.	20010.
APR 7	29.0	0.0	29.0	1060	661		19169.	0.	19169.
APR 8	27.0	0.0	27.0	1040	649		17523.	0.	17523.
APR 9	27.0	0.0	27.0	1030	643		17361.	0.	17361.
APR 10	27.0	0.0	27.0	1040	649		17523.	0.	17523.
APR 11	26.0	0.0	26.0	1080	673		17498.	0.	17498.
APR 12	27.0	0.0	27.0	1070	667		18009.	0.	18009.
APR 13	26.0	0.0	26.0	1080	673		17498.	0.	17498.
APR 14	24.0	0.0	24.0	1100	685		16440.	0.	16440.
APR 15	26.0	0.0	26.0	1100	685		17810.	0.	17810.
APR 16	26.0	0.0	26.0	1100	685		17810.	0.	17810.
APR 17	27.0	0.0	27.0	1070	667		18009.	0.	18009.
APR 18	26.0	0.0	26.0	1090	679		17654.	0.	17654.
APR 19	26.0	0.0	26.0	1070	667		17342.	0.	17342.
APR 20	26.0	0.0	26.0	1070	667		17342.	0.	17342.
APR 21	26.0	0.0	26.0	1080	673		17498.	0.	17498.
APR 22	26.0	0.0	26.0	1070	667		17342.	0.	17342.
APR 23	26.0	0.0	26.0	1080	673		17498.	0.	17498.
APR 24	26.0	0.0	26.0	1087 (1)	677		17602.	0.	17602.
APR 25	27.0	0.0	27.0	1093 (1)	681		18387.	0.	18387.
APR 26	27.0	0.0	27.0	1100 (1)	685		18495.	0.	18495.
APR 27	26.0	0.0	26.0	1102 (1)	686		17836.	0.	17836.
APR 28	25.7	0.0	25.0	1105 (1)	688		17200.	0.	17200.
APR 29	26.0	0.0	26.0	1108 (1)	690		17940.	0.	17940.
APR 30	27.0	0.0	27.0	1110	691		18657.	0.	18657.
TOTAL	882.	63.4	818.6				562256.	15196.	547120.
MONTHLY WEIGHTED T.D.S.					637				

(1) Daily mean E.C. not recorded by U.S.G.S., E.C. estimated by interpolation.
(2) T.D.S. of the Base Flow estimated.
*Adjusted T.D.S., for Base Flow, calculated by averaging the T.D.S. on the day before and the day after Storm Flow.

TABLE NO. E-2

WEIGHTED T.D.S. CALCULATION SHEET

M.W.D. CROSSING

WATER YEAR 1973-74

$$T.D.S. = \frac{EC}{0.000051(EC)+1.549790}$$

Month-Day	U.S.G.S. Mean Daily Flow (cfs-Day)	Storm Flow (cfs-Day)	Base Flow (cfs-Day)	U.S.G.S. Mean Daily Specific Conductance (E.C.) (Micromhos)	Mean Daily Adjusted T.D.S. (PPM)	Adjusted T.D.S. Times Mean Daily Flow: U.S.G.S. Total Flow	Storm Flow	Base Flow
MAY 1	27.0	0.0	27.0	1080	673	18171.	0.	18171.
MAY 2	27.0	0.0	27.0	1060	661	17847.	0.	17847.
MAY 3	26.0	0.0	26.0	1080	673	17498.	0.	17498.
MAY 4	27.0	0.0	27.0	1060	661	17847.	0.	17847.
MAY 5	28.0	0.0	28.0	1060	661	18508.	0.	18508.
MAY 6	28.0	0.0	28.0	1070	667	18676.	0.	18676.
MAY 7	29.0	0.0	29.0	1090	679	19691.	0.	19691.
MAY 8	29.0	0.0	29.0	1100	685	19865.	0.	19865.
MAY 9	29.0	0.0	29.0	1090	679	19691.	0.	19691.
MAY 10	28.0	0.0	28.0	1110	691	19348.	0.	19348.
MAY 11	28.0	0.0	28.0	1110	691	19348.	0.	19348.
MAY 12	27.0	0.0	27.0	1120	697	18819.	0.	18819.
MAY 13	26.0	0.0	26.0	1110	691	17966.	0.	17966.
MAY 14	26.0	0.0	26.0	1100	685	17810.	0.	17810.
MAY 15	27.0	0.0	27.0	1100	685	18495.	0.	18495.
MAY 16	28.0	0.0	28.0	1100	685	19180.	0.	19180.
MAY 17	28.0	0.0	28.0	1100	685	19180.	0.	19180.
MAY 18	26.0	0.0	26.0	1090	679	17654.	0.	17654.
MAY 19	26.0	0.0	26.0	1080	673	17498.	0.	17498.
MAY 20	26.0	0.0	26.0	1090	679	17654.	0.	17654.
MAY 21	27.0	0.0	27.0	1090	679	18333.	0.	18333.
MAY 22	26.0	0.0	26.0	1100	685	17810.	0.	17810.
MAY 23	26.0	0.0	26.0	1090	679	17654.	0.	17654.
MAY 24	25.0	0.0	25.0	1100	685	17125.	0.	17125.
MAY 25	26.0	0.0	26.0	1100	685	17810.	0.	17810.
MAY 26	26.0	0.0	26.0	1090	679	17654.	0.	17654.
MAY 27	26.0	0.0	26.0	1100	685	17810.	0.	17810.
MAY 28	27.0	0.0	27.0	1080	673	18171.	0.	18171.
MAY 29	28.0	0.0	28.0	1080	673	18844.	0.	18644.
MAY 30	28.0	0.0	28.0	1100	685	19180.	0.	19180.
MAY 31	26.0	0.0	26.0	1100	685	17810.	0.	17810.
TOTAL	837.	0.	837.			568947.	0.	568947.
MONTHLY WEIGHTED T.D.S.					680			

TABLE NO. E-2

WEIGHTED T.D.S. CALCULATION SHEET

M.W.D. CROSSING

WATER YEAR 1973-74

$$T.D.S. = \frac{EC}{0.000051(EC)+1.549790}$$

Month-Day	U.S.G.S. Mean Daily Flow (cfs-Day)	Storm Flow (cfs-Day)	Base Flow (cfs-Day)	U.S.G.S. Mean Daily Specific Conductance (E.C.) (Micromhos)	Mean Daily Adjusted T.D.S. (PPM)	Adjusted T.D.S. Times Mean Daily Flow: U.S.G.S. Total Flow	Adjusted T.D.S. Times Mean Daily Flow: Storm Flow	Adjusted T.D.S. Times Mean Daily Flow: Base Flow
JUN 1	23.0	0.0	23.0	1090	679	15617.	0.	15617.
JUN 2	23.0	0.0	23.0	1060	661	15203.	0.	15203.
JUN 3	24.0	0.0	24.0	1060	661	15864.	0.	15864.
JUN 4	25.0	0.0	25.0	1070	667	16675.	0.	16675.
JUN 5	24.0	0.0	24.0	1060	661	15864.	0.	15864.
JUN 6	24.0	0.0	24.0	1080	673	16152.	0.	16152.
JUN 7	24.0	0.0	24.0	1090	679	16296.	0.	16296.
JUN 8	24.0	0.0	24.0	1100	685	16440.	0.	16440.
JUN 9	24.0	0.0	24.0	1090	679	16296.	0.	16296.
JUN 10	23.0	0.0	23.0	1100	685	15755.	0.	15755.
JUN 11	23.0	0.0	23.0	1110	691	15893.	0.	15893.
JUN 12	22.0	0.0	22.0	1090	679	14938.	0.	14938.
JUN 13	21.0	0.0	21.0	1060	661	13881.	0.	13881.
JUN 14	20.0	0.0	20.0	1050	661	13220.	0.	13220.
JUN 15	20.0	0.0	20.0	1060	661	13220.	0.	13220.
JUN 16	20.0	0.0	20.0	1060	661	13220.	0.	13220.
JUN 17	21.0	0.0	21.0	1070	667	14007.	0.	14007.
JUN 18	22.0	0.0	22.0	1070	667	14674.	0.	14674.
JUN 19	21.0	0.0	21.0	1070	667	14007.	0.	14007.
JUN 20	21.0	0.0	21.0	1070	667	14007.	0.	14007.
JUN 21	21.0	0.0	21.0	1050	655	13755.	0.	13755.
JUN 22	22.0	0.0	22.0	1060	661	14542.	0.	14542.
JUN 23	21.0	0.0	21.0	1060	661	13861.	0.	13861.
JUN 24	21.0	0.0	21.0	1060	661	13861.	0.	13861.
JUN 25	21.0	0.0	21.0	1050	655	13755.	0.	13755.
JUN 26	20.0	0.0	20.0	1070	667	13340.	0.	13340.
JUN 27	20.0	0.0	20.0	1070	667	13340.	0.	13340.
JUN 28	20.0	0.0	20.0	1080	673	13460.	0.	13460.
JUN 29	19.0	0.0	19.0	1090	679	12901.	0.	12901.
JUN 30	20.0	0.0	20.0	1090	679	13580.	0.	13580.
TOTAL	654.	0.	654.			437664.	0.	437664.
MONTHLY WEIGHTED T.D.S.					669			

TABLE NO. E-2

WEIGHTED T.D.S. CALCULATION SHEET

M.W.D. CROSSING

WATER YEAR 1973-74

$$T.D.S. = \frac{EC}{0.000051(EC)+1.549790}$$

Month-Day	U.S.G.S. Mean Daily Flow (cfs-Day)	Storm Flow (cfs-Day)	Base Flow (cfs-Day)	U.S.G.S. Mean Daily Specific Conductance (E.C.) (Micromhos)	Mean Daily Adjusted T.D.S. (PPM)	Adjusted T.D.S. Times Mean Daily Flow: U.S.G.S. Total Flow	Storm Flow	Base Flow
JUL 1	21.0	0.0	21.0	1110	691	14511.	0.	14511.
JUL 2	20.0	0.0	20.0	1110	691	13820.	0.	13820.
JUL 3	20.0	0.0	20.0	1120	697	13940.	0.	13940.
JUL 4	20.0	0.0	20.0	1120	697	13940.	0.	13940.
JUL 5	20.0	0.0	20.0	1100	685	13700.	0.	13700.
JUL 6	20.0	0.0	20.0	1100	685	13700.	0.	13700.
JUL 7	20.0	0.0	20.0	1100	685	13700.	0.	13700.
JUL 8	20.0	0.0	20.0	1100	685	13700.	0.	13700.
JUL 9	20.0	0.0	20.0	1100	685	13700.	0.	13700.
JUL 10	20.0	0.0	20.0	1090	679	13580.	0.	13580.
JUL 11	20.0	0.0	20.0	1090	679	13580.	0.	13580.
JUL 12	20.0	0.0	20.0	1090	679	13580.	0.	13580.
JUL 13	20.0	0.0	20.0	1090	679	13560.	0.	13560.
JUL 14	20.0	0.0	20.0	1090	679	13580.	0.	13580.
JUL 15	20.0	0.0	20.0	1110	691	13820.	0.	13820.
JUL 16	19.0	0.0	19.0	1090	679	12901.	0.	12901.
JUL 17	19.0	0.0	19.0	1080	673	12787.	0.	12787.
JUL 18	19.0	0.0	19.0	1080	673	12787.	0.	12787.
JUL 19	19.0	0.0	19.0	1100	685	13015.	0.	13015.
JUL 20	19.0	0.0	19.0	1100	685	13015.	0.	13015.
JUL 21	19.0	0.0	19.0	1100	685	13015.	0.	13015.
JUL 22	19.0	0.0	19.0	1100	685	13015.	0.	13015.
JUL 23	19.0	0.0	19.0	1110	691	13129.	0.	13129.
JUL 24	19.0	0.0	19.0	1100	685	13015.	0.	13015.
JUL 25	18.0	0.0	18.0	1090	679	12222.	0.	12222.
JUL 26	18.0	0.0	18.0	1100	685	12330.	0.	12330.
JUL 27	18.0	0.0	18.0	1100	685	12330.	0.	12330.
JUL 28	18.0	0.0	18.0	1080	673	12114.	0.	12114.
JUL 29	18.0	0.0	18.0	1100	685	12330.	0.	12330.
JUL 30	19.0	0.0	19.0	1120	697	13243.	0.	13243.
JUL 31	19.0	0.0	19.0	1080	673	12787.	0.	12787.
TOTAL	600.	0.	600.			410466.	0.	410466.
MONTHLY WEIGHTED T.D.S.					684			

TABLE NO. E-2

WEIGHTED T.D.S. CALCULATION SHEET

M.W.D. CROSSING

WATER YEAR 1973-74

$$T.D.S. = \frac{EC}{0.000051(EC)+1.549790}$$

Month-Day	U.S.G.S. Mean Daily Flow (cfs-Day)	Storm Flow (cfs-Day)	Base Flow (cfs-Day)	U.S.G.S. Mean Daily Specific Conductance (E.C.) (Micromhos)	Mean Daily Adjusted T.D.S. (PPM)	Adjusted T.D.S. Times Mean Daily Flow: U.S.G.S. Total Flow	Adjusted T.D.S. Times Mean Daily Flow: Storm Flow	Adjusted T.D.S. Times Mean Daily Flow: Base Flow
AUG 1	19.0	0.0	19.0	1080	673	12787.	0.	12787.
AUG 2	18.0	0.0	18.0	1070	667	12006.	0.	12006.
AUG 3	18.0	0.0	18.0	1100	685	12330.	0.	12330.
AUG 4	18.0	0.0	18.0	1100	685	12330.	0.	12330.
AUG 5	18.0	0.0	18.0	1090	679	12222.	0.	12222.
AUG 6	20.0	0.0	20.0	1090	679	13580.	0.	13580.
AUG 7	18.0	0.0	18.0	1110	691	12438.	0.	12438.
AUG 8	18.0	0.0	18.0	1090	679	12222.	0.	12222.
AUG 9	18.0	0.0	18.0	1080	673	12114.	0.	12114.
AUG 10	18.0	0.0	18.0	1060	661	11898.	0.	11898.
AUG 11	19.0	0.0	19.0	1080	673	12787.	0.	12787.
AUG 12	18.0	0.0	18.0	1090	679	12222.	0.	12222.
AUG 13	19.0	0.0	19.0	1100	685	13015.	0.	13015.
AUG 14	19.0	0.0	19.0	1090	679	12901.	0.	12901.
AUG 15	18.0	0.0	18.0	1100	685	12330.	0.	12330.
AUG 16	18.0	0.0	18.0	1100	685	12330.	0.	12330.
AUG 17	18.0	0.0	18.0	1110	691	12438.	0.	12438.
AUG 18	18.0	0.0	18.0	1120	697	12546.	0.	12546.
AUG 19	18.0	0.0	18.0	1110	691	12438.	0.	12438.
AUG 20	18.0	0.0	18.0	1110	691	12438.	0.	12438.
AUG 21	18.0	0.0	18.0	1110	691	12438.	0.	12438.
AUG 22	18.0	0.0	18.0	1130	703	12654.	0.	12654.
AUG 23	19.0	0.0	19.0	1130	703	13357.	0.	13357.
AUG 24	18.0	0.0	18.0	1120	697	12546.	0.	12546.
AUG 25	18.0	0.0	18.0	1110	691	12438.	0.	12438.
AUG 26	18.0	0.0	18.0	1110	691	12438.	0.	12438.
AUG 27	18.0	0.0	18.0	1100	685	12330.	0.	12330.
AUG 28	18.0	0.0	18.0	1120	697	12546.	0.	12546.
AUG 29	18.0	0.0	18.0	1130	703	12654.	0.	12654.
AUG 30	18.0	0.0	18.0	1110	691	12438.	0.	12438.
AUG 31	19.0	0.0	19.0	1110	691	13129.	0.	13129.
TOTAL	566.	0.	566.			388340.	0.	388340.
MONTHLY WEIGHTED T.D.S.					686			

TABLE NO. E-2

WEIGHTED T.D.S. CALCULATION SHEET

M.W.D. CROSSING

WATER YEAR 1973-74

$$T.D.S. = \frac{EC}{0.000051(EC)+1.549790}$$

Month-Day	U.S.G.S. Mean Daily Flow (cfs-Day)	Storm Flow (cfs-Day)	Base Flow (cfs-Day)	U.S.G.S. Mean Daily Specific Conductance (E.C.) (Micromhos)	Mean Daily Adjusted T.D.S. (PPM)	Adjusted T.D.S. Times Mean Daily Flow: U.S.G.S. Total Flow	Storm Flow	Base Flow
SEP 1	18.0	0.0	18.0	1090	679	12222.	0.	12222.
SEP 2	19.0	0.0	19.0	1090	679	12901.	0.	12901.
SEP 3	18.0	0.0	18.0	1100	685	12330.	0.	12330.
SEP 4	18.0	0.0	18.0	1090	679	12222.	0.	12222.
SEP 5	18.0	0.0	18.0	1090	679	12222.	0.	12222.
SEP 6	18.0	0.0	18.0	1070	667	12006.	0.	12006.
SEP 7	18.0	0.0	18.0	1070	667	12006.	0.	12006.
SEP 8	18.0	0.0	18.0	1070	667	12006.	0.	12006.
SEP 9	17.0	0.0	17.0	1090	679	11543.	0.	11543.
SEP 10	17.0	0.0	17.0	1060	661	11237.	0.	11237.
SEP 11	18.0	0.0	18.0	1070	667	12006.	0.	12006.
SEP 12	18.0	0.0	18.0	1060	661	11898.	0.	11898.
SEP 13	18.0	0.0	18.0	1050	655	11790.	0.	11790.
SEP 14	18.0	0.0	18.0	1060	661	11898.	0.	11898.
SEP 15	18.0	0.0	18.0	1065 (1)	664	11952.	0.	11952.
SEP 16	18.0	0.0	18.0	1070 (1)	667	12006.	0.	12006.
SEP 17	18.0	0.0	18.0	1075 (1)	670	12060.	0.	12060.
SEP 18	18.0	0.0	18.0	1080	673	12114.	0.	12114.
SEP 19	18.0	0.0	18.0	1120	697	12546.	0.	12546.
SEP 20	19.0	0.0	19.0	1100	685	13015.	0.	13015.
SEP 21	19.0	0.0	19.0	1100	685	13015.	0.	13015.
SEP 22	18.0	0.0	18.0	1100	685	12330.	0.	12330.
SEP 23	18.0	0.0	18.0	1090	679	12222.	0.	12222.
SEP 24	18.0	0.0	18.0	1090	679	12222.	0.	12222.
SEP 25	18.0	0.0	18.0	1090	679	12222.	0.	12222.
SEP 26	18.0	0.0	18.0	1100	685	12330.	0.	12330.
SEP 27	18.0	0.0	18.0	1100	685	12330.	0.	12330.
SEP 28	18.0	0.0	18.0	1100	685	12330.	0.	12330.
SEP 29	18.0	0.0	18.0	1100	685	12330.	0.	12330.
SEP 30	18.0	0.0	18.0	1120	697	12546.	0.	12546.
TOTAL	541.	0.	541.			365857.	0.	365857.
MONTHLY WEIGHTED T.D.S.					676			

(1) Daily mean E.C. not recorded by U.S.G.S., E.C. estimated by interpolation.

TABLE NO. E-3

SUMMARY
OF
WATER QUALITY FOR THE RIVERSIDE NARROWS
AT
METROPOLITAN WATER DISTRICT (MWD) CROSSING
WATER YEAR 1973-74

Month		Mean Daily Flow			Monthly Weighted Average Adjusted T.D.S. (ppm)	Mean Daily Flow Times Adjusted T.D.S.		
		U.S.G.S. Total Flow (cfs-Days)	Storm Flow (cfs-Days)	Base Flow (cfs-Days)		U.S.G.S. Total Flow	Storm Flow	Base Flow
1973	October	634	0.0	634	676	428,818	0	428,818
	November	866	211.0	655.0	652	564,801	129,419	435,382
	December	723	4.0	719.0	672	485,501	2,632	482,869
1974	January	4,075	3,267.0	808.0	360	1,476,868	932,586	544,282
	February	923	13.8	909.2	667	615,495	7,077	608,418
	March	1,552	578.0	974.0	494	786,460	133,721	652,739
	April	882	63.4	818.6	637	562,256	15,136	547,120
	May	837	0.0	837	680	568,947	0	568,947
	June	654	0.0	654	669	437,664	0	437,664
	July	600	0.0	600	684	410,466	0	410,466
	August	566	0.0	566	686	388,340	0	388,340
	September	541	0.0	541	676	365,857	0	365,857
	Total	12,853	4,137.2	8,715.8		7,091,473	1,220,571	5,870,902
Total A.F.		25,494	8,206	17,288				

Weighted Average Annual (Base Flow) T.D.S. = $\frac{5870902}{8715.8}$ = 674 ppm

Weighted Average Annual (Storm Flow) T.D.S. = $\frac{1220571}{4137.2}$ = 295 ppm

Weighted Average Annual (Total Flow) T.D.S. = $\frac{7091473}{12853}$ = 552 ppm

TABLE NO. E-4

U.S.G.S. WATER QUALITY SAMPLES
RIVERSIDE QUALITY CONTROL PLANT
WATER YEAR 1973-74

Date		E.C.	T.D.S.
1973	October	972	582
		968	569
		1100	626
		1020	575
	November	1060	599
		1040	603
		1040	603
		909	505
	December	925	530
		950	538
		910	483
		850	485
1974	January	855	503
		969	554
		911	529
	February	1190	783
		1200	667
		1230	692
		1300	723
	March	1110	609
		1180	633
		1110	589
		1030	579
	April	1210	700
		1200	704
		1290	519
		1170	692
	May	1230	728
		980	584
		1010	600
		1120	631
		1080	639
	June	1120	650
		1100	647
		1180	695
		1240	735
	July	1140	686
		1120	678
		1110	685
		1110	675
	August	1130	697
		1100	674
		1100	664
		1140	682
		1160	692
	September	1110	673
		1110	678
		1140	702
		1120	680

TABLE NO. E-5

WEIGHTED T.D.S. CALCULATION SHEET

RIVERSIDE QUALITY CONTROL PLANT WATER YEAR 1973-1974 TDS=EC/(0.000046(EC)+ 1.679334)

MONTH-DAY	U.S.G.S. MEAN DAILY FLOW (CFS-DAY)	U.S.G.S. MEAN DAILY SPECIFIC CONDUCTANCE (E.C.) (MICROMHOS)	MEAN DAILY ADJUSTED T.D.S. (PPM)	MEAN DAILY FLOW TIMES ADJUSTED T.D.S.
OCT 1	27.0	1040	602	16254.
OCT 2	27.0	1020	591	15957.
OCT 3	27.0	1020	591	15957.
OCT 4	27.0	1080	625	16875.
OCT 5	28.0	1050	608	17024.
OCT 6	26.0	1080	625	16250.
OCT 7	25.0	1010	585	14625.
OCT 8	28.0	979	568	15904.
OCT 9	28.0	998	578	16184.
OCT 10	27.0	999	579	15633.
OCT 11	27.0	1020	591	15957.
OCT 12	27.0	1100	636	17172.
OCT 13	26.0	1100	636	16536.
OCT 14	26.0	1040	602	15652.
OCT 15	28.0	1060	613	17164.
OCT 16	28.0	1090	630	17640.
OCT 17	27.0	1080	625	16875.
OCT 18	28.0	1110	641	17948.
OCT 19	28.0	1120	647	18116.
OCT 20	26.0	1120	647	16822.
OCT 21	24.0	1070	619	14856.
OCT 22	28.0	1040	602	16856.
OCT 23	28.0	1070	619	17332.
OCT 24	27.0	1050	608	16416.
OCT 25	27.0	1020	591	15957.
OCT 26	27.0	1060	613	16551.
OCT 27	26.0	1060	613	15938.
OCT 28	26.0	1040	602	15652.
OCT 29	28.0	1040	602	16856.
OCT 30	27.0	1100	636	17172.
OCT 31	27.0	1070	619	16713.
TOTAL	836.			510844.
MONTHLY WEIGHTED T.D.S.			611	

TABLE NO. E-5

WEIGHTED T.D.S. CALCULATION SHEET

RIVERSIDE QUALITY CONTROL PLANT WATER YEAR 1973-1974 TDS=EC/(0.000046(EC)+ 1.679334)

MONTH-DAY	U.S.G.S. MEAN DAILY FLOW (CFS-DAY)	U.S.G.S. MEAN DAILY SPECIFIC CONDUCTANCE (E.C.) (MICROMHOS)	MEAN DAILY ADJUSTED T.D.S. (PPM)	MEAN DAILY FLOW TIMES ADJUSTED T.D.S.
NOV 1	28.0	1090	630	17640.
NOV 2	28.0	1090	630	17640.
NOV 3	26.0	1090	630	16380.
NOV 4	25.0	1020	591	14775.
NOV 5	28.0	1138	657	18396.
NOV 6	27.0	1120	647	17469.
NOV 7	27.0	1060	613	16551.
NOV 8	28.0	1030	597	16716.
NOV 9	28.0	1050	608	17024.
NOV 10	26.0	1030	597	15522.
NOV 11	26.0	1010	585	15210.
NOV 12	28.0	1070	619	17332.
NOV 13	28.0	1140	658	18424.
NOV 14	27.0	1110	641	17307.
NOV 15	27.0	1060	613	16551.
NOV 16	27.0	1050	608	16416.
NOV 17	26.0	1060	613	15938.
NOV 18	28.0	965	560	15680.
NOV 19	28.0	921	535	14980.
NOV 20	27.0	1000	580	15660.
NOV 21	27.0	1020	591	15957.
NOV 22	23.0	974	565	12995.
NOV 23	24.0	926	538	12912.
NOV 24	24.0	960	557	13368.
NOV 25	25.0	970	563	14075.
NOV 26	27.0	891	518	13986.
NOV 27	26.0	909	528	13728.
NOV 28	26.0	919	534	13884.
NOV 29	26.0	949	551	14326.
NOV 30	26.0	941	546	14196.
TOTAL	797.			471038.
MONTHLY WEIGHTED T.D.S.			591	

TABLE NO. E-5

WEIGHTED T.D.S. CALCULATION SHEET

RIVERSIDE QUALITY CONTROL PLANT WATER YEAR 1973-1974 TDS=EC/(0.000046(EC)+ 1.679334)

MONTH-DAY	U.S.G.S. MEAN DAILY FLOW (CFS-DAY)	U.S.G.S. MEAN DAILY SPECIFIC CONDUCTANCE (E.C.) (MICROMHOS)	MEAN DAILY ADJUSTED T.D.S. (PPM)	MEAN DAILY FLOW TIMES ADJUSTED T.D.S.
DEC 1	24.0	918	533	12792.
DEC 2	25.0	880	512	12800.
DEC 3	28.0	888	516	14448.
DEC 4	27.0	908	528	14256.
DEC 5	26.0	906	526	13676.
DEC 6	27.0	909	528	14256.
DEC 7	26.0	872	507	13182.
DEC 8	26.0	880	512	13312.
DEC 9	23.0	868	505	11615.
DEC 10	26.0	940	546	14196.
DEC 11	26.0	929	539	14014.
DEC 12	26.0	926	538	13988.
DEC 13	26.0	936	543	14118.
DEC 14	26.0	953	553	14378.
DEC 15	26.0	948	550	14300.
DEC 16	25.0	917	533	13325.
DEC 17	27.0	917	533	14391.
DEC 18	26.0	927	538	13988.
DEC 19	26.0	914	531	13806.
DEC 20	26.0	939	545	14170.
DEC 21	26.0	941	546	14196.
DEC 22	24.0	932	541	12984.
DEC 23	23.0	909	528	12144.
DEC 24	24.0	926	538	12912.
DEC 25	21.0	914	531	11151.
DEC 26	23.0	897	521	11983.
DEC 27	24.0	963	559	13416.
DEC 28	24.0	1030	597	14328.
DEC 29	23.0	1010	585	13455.
DEC 30	22.0	997	578	12716.
DEC 31	25.0	927	538	13450.
TOTAL	777.0			417746.
MONTHLY WEIGHTED T.D.S.			538	

TABLE NO. E-5

WEIGHTED T.D.S. CALCULATION SHEET

RIVERSIDE QUALITY CONTROL PLANT WATER YEAR 1973-1974 TDS=EC/(0.000046(EC)+ 1.679334)

MONTH-DAY	U.S.G.S. MEAN DAILY FLOW (CFS-DAY)	U.S.G.S. MEAN DAILY SPECIFIC CONDUCTANCE (E.C.) (MICROMHOS)	MEAN DAILY ADJUSTED T.D.S. (PPM)	MEAN DAILY FLOW TIMES ADJUSTED T.D.S.
JAN 1	21.0	879	511	10731.
JAN 2	25.0	922	536	13400.
JAN 3	25.0	982	569	14225.
JAN 4	28.0	947	550	15400.
JAN 5	26.0	870	506	13156.
JAN 6	24.0	960	557	13368.
JAN 7	31.0	906	526	16306.
JAN 8	30.0	917	533	15990.
JAN 9	27.0	1040	602	16254.
JAN 10	27.0	1070	619	16713.
JAN 11	27.0	1060	613	16551.
JAN 12	26.0	1080	625	16250.
JAN 13	26.0	1050	608	15808.
JAN 14	26.0	999	579	15054.
JAN 15	27.0	1030	597	16119.
JAN 16	27.0	1030	597	16119.
JAN 17	27.0	1010	585	15795.
JAN 18	27.0	980	568	15336.
JAN 19	25.0	978	567	14175.
JAN 20	25.0	946	549	13725.
JAN 21	27.0	937	544	14688.
JAN 22	26.0	967	561	14586.
JAN 23	26.0	991	575	14950.
JAN 24	27.0	1030	597	16119.
JAN 25	26.0	1100	636	16536.
JAN 26	26.0	1090	630	16380.
JAN 27	25.0	1080	625	15625.
JAN 28	26.0	1090	630	16380.
JAN 29	26.0	1150	664	17264.
JAN 30	26.0	1120	647	16822.
JAN 31	27.0	1140	658	17766.
TOTAL	815.0			477591.
MONTHLY WEIGHTED T.D.S.			586	

WEIGHTED T.D.S. CALCULATION SHEET

RIVERSIDE QUALITY CONTROL PLANT WATER YEAR 1973-1974 TDS=EC/(0.000046(EC)+ 1.679334)

MONTH-DAY	U.S.G.S. MEAN DAILY FLOW (CFS-DAY)	U.S.G.S. MEAN DAILY SPECIFIC CONDUCTANCE (E.C.) (MICROMHOS)	MEAN DAILY ADJUSTED T.D.S. (PPM)	MEAN DAILY FLOW TIMES ADJUSTED T.D.S.
FEB 1	26.0	1110	641	16666.
FEB 2	25.0	1080	625	15625.
FEB 3	23.0	1040	602	13846.
FEB 4	27.0	1050	608	16416.
FEB 5	26.0	1150	664	17264.
FEB 6	26.0	1240	714	18564.
FEB 7	26.0	1260	725	18850.
FEB 8	26.0	1220	703	18278.
FEB 9	25.0	1210	697	17425.
FEB 10	23.0	1150	664	15272.
FEB 11	26.0	1150	664	17264.
FEB 12	26.0	1190	686	17836.
FEB 13	26.0	1240	714	18564.
FEB 14	26.0	1260	725	18850.
FEB 15	26.0	1200	692	17992.
FEB 16	27.0	1180	681	18367.
FEB 17	23.0	1140	658	15134.
FEB 18	27.0	1190	686	18522.
FEB 19	26.0	1210	697	18122.
FEB 20	26.0	1250	720	18720.
FEB 21	26.0	1270	731	19006.
FEB 22	26.0	1230	709	18434.
FEB 23	25.0	1230	709	17725.
FEB 24	24.0	1130	653	15672.
FEB 25	28.0	1130	653	18284.
FEB 26	26.0	1210	697	18122.
FEB 27	26.0	1360	781	20306.
FEB 28	26.0	1360	781	20306.
TOTAL	719.			495452.
MONTHLY WEIGHTED T.D.S.			689	

TABLE NO. E-5

WEIGHTED T.D.S. CALCULATION SHEET

RIVERSIDE QUALITY CONTROL PLANT WATER YEAR 1973-1974 TDS=EC/(0.000046(EC)+ 1.679334)

MONTH-DAY	U.S.G.S. MEAN DAILY FLOW (CFS-DAY)	U.S.G.S. MEAN DAILY SPECIFIC CONDUCTANCE (E.C.) (MICROMHOS)	MEAN DAILY ADJUSTED T.D.S. (PPM)	MEAN DAILY FLOW TIMES ADJUSTED T.D.S.
MAR 1	27.0	1200	692	18684.
MAR 2	27.0	1140	658	17766.
MAR 3	25.0	1160	669	16725.
MAR 4	27.0	1160	669	18063.
MAR 5	27.0	1140	658	17766.
MAR 6	27.0	1150	664	17928.
MAR 7	26.0	1150	664	17264.
MAR 8	28.0	1090	630	17640.
MAR 9	26.0	1140	658	17108.
MAR 10	25.0	1170	675	16875.
MAR 11	28.0	1200	692	19376.
MAR 12	27.0	1150	664	17928.
MAR 13	27.0	1120	647	17469.
MAR 14	27.0	1100	636	17172.
MAR 15	27.0	1050	608	16416.
MAR 16	25.0	1030	597	14925.
MAR 17	24.0	1040	602	14448.
MAR 18	26.0	1070	619	16094.
MAR 19	29.0	1070	619	17951.
MAR 20	26.0	1140	658	17108.
MAR 21	27.0	1110	641	17307.
MAR 22	27.0	1160	669	18063.
MAR 23	26.0	1100	636	16536.
MAR 24	25.0	1020	591	14775.
MAR 25	27.0	1010	585	15795.
MAR 26	28.0	1070	619	17332.
MAR 27	27.0	1040	602	16254.
MAR 28	27.0	1040	602	16254.
MAR 29	27.0	1030	597	16119.
MAR 30	26.0	982	569	14794.
MAR 31	24.0	932	541	12984.
TOTAL	822.0			520919.
MONTHLY WEIGHTED T.D.S.			634	

TABLE NO. E-5

WEIGHTED T.D.S. CALCULATION SHEET

RIVERSIDE QUALITY CONTROL PLANT WATER YEAR 1973-1974 TDS=EC/(0.000046(EC)+ 1.679334)

MONTH-DAY	U.S.G.S. MEAN DAILY FLOW (CFS-DAY)	U.S.G.S. MEAN DAILY SPECIFIC CONDUCTANCE (E.C.) (MICROMHOS)	MEAN DAILY ADJUSTED T.D.S. (PPM)	MEAN DAILY FLOW TIMES ADJUSTED T.D.S.
APR 1	27.0	987	572	15444.
APR 2	28.0	1060	613	17164.
APR 3	28.0	1140	658	18424.
APR 4	27.0	1230	709	19143.
APR 5	27.0	1220	703	18981.
APR 6	26.0	1160	669	17394.
APR 7	25.0	1140	658	16450.
APR 8	28.0	1190	686	19208.
APR 9	26.0	1260	725	18850.
APR 10	28.0	1280	736	20608.
APR 11	28.0	1250	720	20160.
APR 12	27.0	1270	731	19737.
APR 13	26.0	1210	697	18122.
APR 14	23.0	1240	714	16422.
APR 15	27.0	1340	770	20790.
APR 16	26.0	1370	786	20436.
APR 17	26.0	1290	742	19292.
APR 18	27.0	1240	714	19278.
APR 19	27.0	1300	747	20169.
APR 20	25.0	1260	725	18125.
APR 21	25.0	1200	692	17300.
APR 22	28.0	1170	675	18900.
APR 23	27.0	1240	714	19278.
APR 24	28.0	1290	742	20776.
APR 25	29.0	1190	686	19894.
APR 26	27.0	1210	697	18819.
APR 27	26.0	1170	675	17550.
APR 28	25.0	1150	664	16600.
APR 29	28.0	1140	658	18424.
APR 30	28.0	1200	692	19376.
TOTAL	803.			561114.
MONTHLY WEIGHTED T.D.S.			699	

TABLE NO. E-5

WEIGHTED T.D.S. CALCULATION SHEET

RIVERSIDE QUALITY CONTROL PLANT WATER YEAR 1973-1974 TDS=EC/(0.000046(EC)+ 1.679334)

MONTH-DAY	U.S.G.S. MEAN DAILY FLOW (CFS-DAY)	U.S.G.S. MEAN DAILY SPECIFIC CONDUCTANCE (E.C.) (MICROMHOS)	MEAN DAILY ADJUSTED T.D.S. (PPM)	MEAN DAILY FLOW TIMES ADJUSTED T.D.S.
MAY 1	28.0	1280	736	20608.
MAY 2	28.0	1200	692	19376.
MAY 3	28.0	1200	692	19376.
MAY 4	26.0	1100	636	16536.
MAY 5	25.0	1010	585	14625.
MAY 6	28.0	978	567	15876.
MAY 7	28.0	958	556	15568.
MAY 8	28.0	990	574	16072.
MAY 9	30.0	1040	602	18060.
MAY 10	30.0	1100	636	19080.
MAY 11	29.0	983	570	16530.
MAY 12	28.0	914	531	14868.
MAY 13	30.0	933	542	16260.
MAY 14	29.0	974	565	16385.
MAY 15	30.0	1010	585	17550.
MAY 16	30.0	1010	585	17550.
MAY 17	30.0	981	569	17070.
MAY 18	28.0	981	569	15932.
MAY 19	27.0	972	564	15228.
MAY 20	30.0	986	572	17160.
MAY 21	27.0	1040	602	16254.
MAY 22	28.0	1140	658	18424.
MAY 23	28.0	1130	653	18284.
MAY 24	30.0	1170	675	20250.
MAY 25	27.0	1180	681	18387.
MAY 26	25.0	1110	641	16025.
MAY 27	27.0	1120	647	17469.
MAY 28	28.0	1150	664	18592.
MAY 29	27.0	1170	675	18225.
MAY 30	29.0	1120	647	18763.
MAY 31	29.0	1160	669	19401.
TOTAL	875.			539784.
MONTHLY WEIGHTED T.D.S.			617	

WEIGHTED T.D.S. CALCULATION SHEET

RIVERSIDE QUALITY CONTROL PLANT WATER YEAR 1973-1974 TDS=EC/(0.000046(EC)+ 1.679334)

MONTH-DAY	U.S.G.S. MEAN DAILY FLOW (CFS-DAY)	U.S.G.S. MEAN DAILY SPECIFIC CONDUCTANCE (E.C.) (MICROMHOS)	MEAN DAILY ADJUSTED T.D.S. (PPM)	MEAN DAILY FLOW TIMES ADJUSTED T.D.S.
JUN 1	27.0	1110	641	17307.
JUN 2	27.0	1050	608	16416.
JUN 3	29.0	1060	613	17777.
JUN 4	29.0	1100	636	18444.
JUN 5	30.0	1150	664	19920.
JUN 6	29.0	1160	669	19401.
JUN 7	29.0	1110	641	18589.
JUN 8	29.0	1070	619	17951.
JUN 9	27.0	1010	585	15795.
JUN 10	30.0	1050	608	18240.
JUN 11	29.0	1100	636	18444.
JUN 12	30.0	1080	625	18750.
JUN 13	31.0	1080	625	19375.
JUN 14	31.0	1110	641	19871.
JUN 15	29.0	1140	658	19082.
JUN 16	28.0	1080	625	17500.
JUN 17	31.0	1160	669	20739.
JUN 18	31.0	1160	669	20739.
JUN 19	30.0	1170	675	20250.
JUN 20	29.0	1180	681	19749.
JUN 21	30.0	1180	681	20430.
JUN 22	28.0	1120	647	18116.
JUN 23	26.0	1060	613	15938.
JUN 24	29.0	1110	641	18589.
JUN 25	29.0	1220	703	20387.
JUN 26	29.0	1260	725	21025.
JUN 27	28.0	1260	725	20300.
JUN 28	28.0	1260	725	20300.
JUN 29	27.0	1280	736	19872.
JUN 30	25.0	1240	714	17850.
TOTAL	864.			567146.
MONTHLY WEIGHTED T.D.S.			656	

WEIGHTED T.D.S. CALCULATION SHEET

RIVERSIDE QUALITY CONTROL PLANT WATER YEAR 1973-1974 TDS=EC/(0.000046(EC)+ 1.6793341

MONTH-DAY	U.S.G.S. MEAN DAILY FLOW (CFS-DAY)	U.S.G.S. MEAN DAILY SPECIFIC CONDUCTANCE (E.C.) (MICROMHOS)	MEAN DAILY ADJUSTED T.D.S. (PPM)	MEAN DAILY FLOW TIMES ADJUSTED T.D.S.
JUL 1	28.0	1160	669	18732.
JUL 2	27.0	1170	675	18225.
JUL 3	27.0	1140	658	17766.
JUL 4	27.0	1200	692	18684.
JUL 5	29.0	1170	675	19575.
JUL 6	27.0	1130	653	17631.
JUL 7	26.0	1120	647	16822.
JUL 8	29.0	1130	653	18937.
JUL 9	29.0	1190	686	19894.
JUL 10	28.0	1220	703	19684.
JUL 11	28.0	1120	647	18116.
JUL 12	28.0	1130	653	18284.
JUL 13	26.0	1150	664	17264.
JUL 14	25.0	1140	658	16450.
JUL 15	29.0	1120	647	18763.
JUL 16	28.0	1150	664	18592.
JUL 17	27.0	1190	686	18522.
JUL 18	27.0	1180	681	18387.
JUL 19	28.0	1190	686	19208.
JUL 20	27.0	1200	692	18684.
JUL 21	24.0	1170	675	16200.
JUL 22	27.0	1160	669	18063.
JUL 23	27.0	1170	675	18225.
JUL 24	27.0	1220	703	18981.
JUL 25	27.0	1190	686	18522.
JUL 26	28.0	1200	692	19376.
JUL 27	25.0	1210	697	17425.
JUL 28	25.0	1170	675	16875.
JUL 29	28.0	1160	669	18732.
JUL 30	29.0	1200	692	20068.
JUL 31	27.0	1180	681	18387.
TOTAL	844.			569074.
MONTHLY WEIGHTED T.D.S.			674	

WEIGHTED T.D.S. CALCULATION SHEET

RIVERSIDE QUALITY CONTROL PLANT WATER YEAR 1973-1974 TDS=EC/(0.000046(EC)+ 1.679334)

MONTH-DAY	U.S.G.S. MEAN DAILY FLOW (CFS-DAY)	U.S.G.S. MEAN DAILY SPECIFIC CONDUCTANCE (E.C.) (MICROMHOS)	MEAN DAILY ADJUSTED T.D.S. (PPM)	MEAN DAILY FLOW TIMES ADJUSTED T.D.S.
AUG 1	29.0	1170	675	19575.
AUG 2	30.0	1180	681	20430.
AUG 3	27.0	1160	669	18063.
AUG 4	26.0	1140	658	17108.
AUG 5	30.0	1140	658	19740.
AUG 6	29.0	1140	658	19082.
AUG 7	29.0	1140	658	19082.
AUG 8	29.0	1140	658	19082.
AUG 9	28.0	1180	681	19068.
AUG 10	27.0	1180	681	18387.
AUG 11	26.0	1130	653	16978.
AUG 12	29.0	1110	641	18589.
AUG 13	29.0	1140	658	19082.
AUG 14	28.0	1130	653	18284.
AUG 15	29.0	1130	653	18937.
AUG 16	29.0	1140	658	19082.
AUG 17	27.0	1150	664	17928.
AUG 18	26.0	1120	647	16822.
AUG 19	29.0	1140	658	19082.
AUG 20	28.0	1150	664	18592.
AUG 21	28.0	1150	664	18592.
AUG 22	28.0	1140	658	18424.
AUG 23	28.0	1160	669	18732.
AUG 24	27.0	1150	664	17928.
AUG 25	26.0	1110	641	16666.
AUG 26	29.0	1110	641	18589.
AUG 27	28.0	1160	669	18732.
AUG 28	28.0	1170	675	18900.
AUG 29	29.0	1190	686	19894.
AUG 30	28.0	1200	692	19376.
AUG 31	26.0	1180	681	17706.
TOTAL	869.			576532.
MONTHLY WEIGHTED T.D.S.			663	

WEIGHTED T.D.S. CALCULATION SHEET

RIVERSIDE QUALITY CONTROL PLANT WATER YEAR 1973-1974 TDS=EC/(0.000046(EC)+ 1.679334)

MONTH-DAY	U.S.G.S. MEAN DAILY FLOW (CFS-DAY)	U.S.G.S. MEAN DAILY SPECIFIC CONDUCTANCE (E.C.) (MICROMHOS)	MEAN DAILY ADJUSTED T.D.S. (PPM)	MEAN DAILY FLOW TIMES ADJUSTED T.D.S.
SEP 1	24.0	1090	630	15120.
SEP 2	26.0	1070	619	16094.
SEP 3	28.0	1120	647	18116.
SEP 4	29.0	1150	664	19256.
SEP 5	28.0	1150	664	18592.
SEP 6	29.0	1250	720	20880.
SEP 7	27.0	1170	675	18225.
SEP 8	26.0	1100	636	16536.
SEP 9	29.0	1100	636	18444.
SEP 10	29.0	1130	653	18937.
SEP 11	29.0	1150	664	19256.
SEP 12	29.0	1150	664	19256.
SEP 13	29.0	1160	669	19401.
SEP 14	27.0	1100	636	17172.
SEP 15	26.0	1050	608	15808.
SEP 16	29.0	1060	613	17777.
SEP 17	29.0	1150	664	19256.
SEP 18	29.0	1150	664	19256.
SEP 19	29.0	1130	653	18937.
SEP 20	29.0	1120	647	18763.
SEP 21	27.0	1110	641	17307.
SEP 22	27.0	1100	636	17172.
SEP 23	30.0	1110	641	19230.
SEP 24	29.0	1160	669	19401.
SEP 25	29.0	1170	675	19575.
SEP 26	28.0	1150	664	18592.
SEP 27	29.0	1150	664	19256.
SEP 28	27.0	1120	647	17469.
SEP 29	26.0	1080	625	16250.
SEP 30	29.0	1050	608	17632.
TOTAL	841.			546966.
MONTHLY WEIGHTED T.D.S.			650	

TABLE NO. E-6

SUMMARY OF WATER QUALITY
FOR THE
RIVERSIDE WATER QUALITY CONTROL PLANT
AT
RIVERSIDE NARROWS
WATER YEAR 1973-74

Month	Monthly Flow Sec. Ft. Days	Mean Daily Flow Times Adjusted TDS	Average Monthly TDS	
October	836	510,844	611	
November	797	471,038	591	
December	777	417,746	538	
January	815	477,591	586	
February	719	495,452	689	
March	822	520,919	634	
April	803	561,114	699	
May	875	539,784	617	
June	864	567,146	656	
July	844	569,074	674	
August	869	576,532	663	
September	841	546,966	650	
Totals	9,862	6,254,206		
Total A.F.	19,561			

Note: Monthly totals from Table No. 4.

Weighted Average Annual TDS at the Riverside Quality Control Plant $= \frac{6,254,206}{9,862} = 634$ ppm

SANTA ANA RIVER WATERSHED

MT. SAN ANTONIO
ELEV. 10080'

CAJON SUMMIT
ELEV. 4259'

SAN GABRIEL MOUNTAINS

SAN BERNARDINO COUNTY

LOS ANGELES COUNTY

SAN ANTONIO WASH

CUCAMONGA CREEK

CAJON WASH

SAN BERNARDINO VALLEY MUNICIPAL WATER DISTRICT

CHINO BASIN MUNICIPAL WATER DISTRICT

POMONA
ELEV. 848'

ONTARIO
ELEV. 998'

CHINO
ELEV. 730'

CHINO CREEK

PRADO RESERVOIR

RIVERSIDE NARROWS GAGING STATION

RIVERSIDE NARROWS

PRADO GAGING STATION

PRADO DAM

CORONA
ELEV. 678'

TEMESCAL WASH

WESTERN MUNICIPAL WATER DISTRICT OF RIVERSIDE COUNTY

ELEV. 1049'
SAN BERNARDINO

EAST TWIN CREEK

BERNARDINO CREEK

WARM CREEK

CITY CREEK

SAN TIMOTEO CANYON

COLTON

SLOVER MOUNTAIN
ELEV. 980'

JURUPA MOUNTAINS

PEDLEY HILLS

LA LOMA HILLS

RIVERSIDE COUNTY

ELEV. 858'
RIVERSIDE

REDLANDS
ELEV. 1357'

MENTONE
ELEV. 1640'

CRAFTON HILLS

YUCAIPA PLAIN

YUCAIPA
ELEV. 2682'

YUCAIPA HILLS

BEAR CREEK

ELEV. 6738'
BIG BEAR LAKE

SANTA ANA RIVER

SAN GORGONIO MOUNTAIN
ELEV. 11502'

PIGEON PASS
ELEV. 1910'

BADLANDS

BEAUMONT PLAIN

ELEV. 2600'
BEAUMONT

SAN GORGONIO PASS
ELEV. 2616'

SAN JACINTO MOUNTAINS

SAN JACINTO FAULT

SANTIAGO CREEK

SANTA ANA MOUNTAINS

SANTIAGO PEAK
ELEV. 5687'

THE GAVILAN

TEMESCAL PLATEAU

PUENTE HILLS

BUENA PARK
ELEV. 75'

FULLERTON
ELEV. 164'

ANAHEIM
ELEV. 157'

SEAL BEACH

SANTA ANA
ELEV. 111'

NEWPORT BEACH

ORANGE COUNTY WATER DISTRICT

SAN JOAQUIN HILLS

PACIFIC OCEAN

N

SCALE OF MILES
4 0 4 8

PLATE 1

OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
0.09	1.48	0.14	6.88	0.28	3.00	0.78	0.05	0.0	0.0	0.0	0.02

INCHES

1.69 1.61

SAN BERNARDINO RAINFALL
(COUNTY HOSPITAL)

CUBIC FEET PER SECOND

1,733 2,375 1,541 1,440 755 794 527 395 369 416 943 206 204 202 213 205 216 201

OUTFLOW FROM PRADO DAM

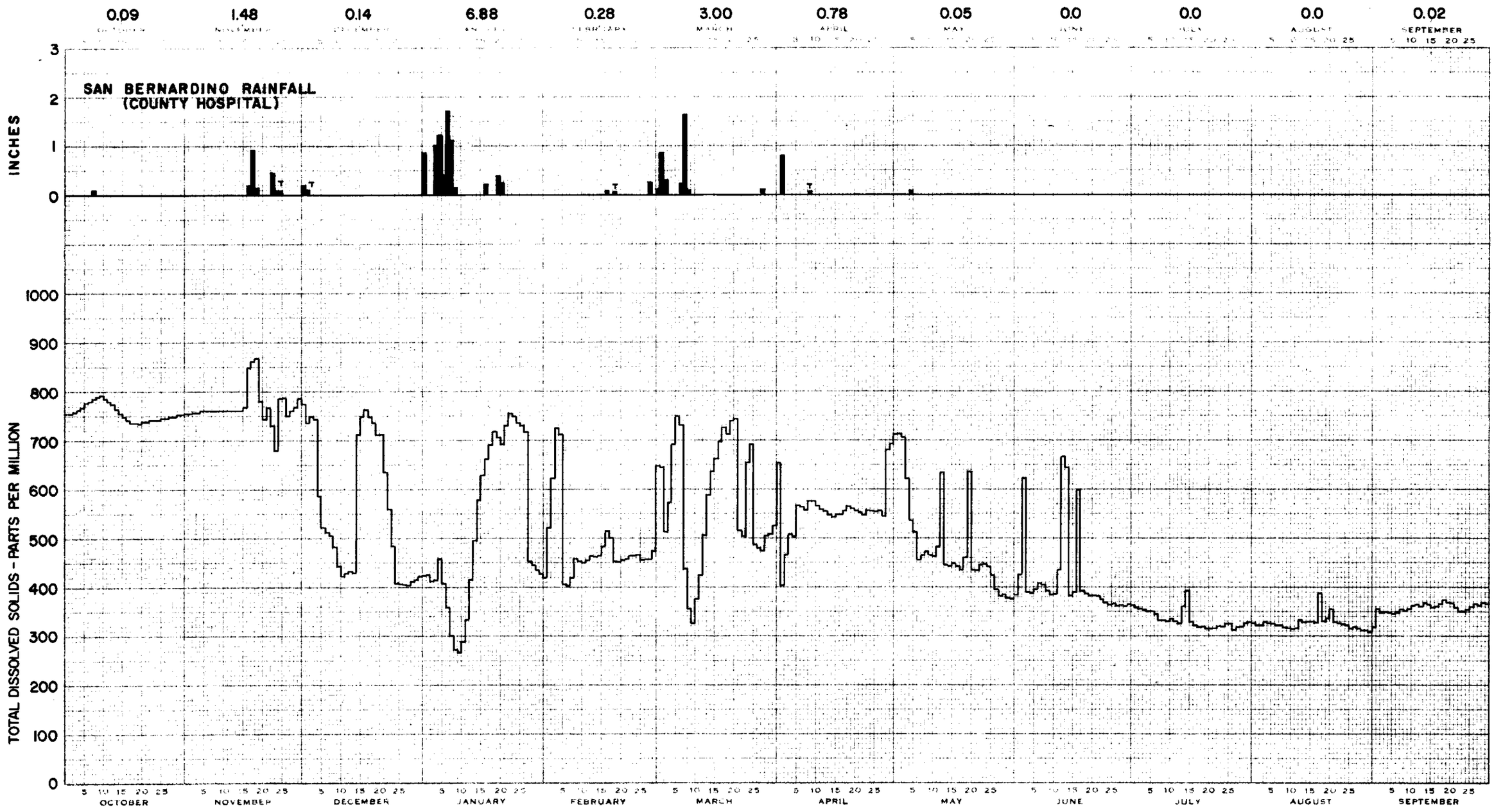
INFLOW TO PRADO DAM LESS NON-TRIBUTARY RELEASES FROM OC-59T

-1.8 -21.3 -25.3 -3.2

1973 1974

DISCHARGE OF SANTA ANA RIVER BELOW PRADO DAM

PLATE 2
(WATER YEAR 1973-74)



DISSOLVED SOLIDS IN THE SANTA ANA RIVER BELOW PRADO DAM
AS DERIVED FROM SPECIFIC CONDUCTIVITY VALUES
MEASURED BY THE USGS MONITORING STATION

PLATE 3
(WATER YEAR 73/74)

OCTOBER 5 10 15 20 25 | NOVEMBER 5 10 15 20 25 | DECEMBER 5 10 15 20 25 | JANUARY 5 10 15 20 25 | FEBRUARY 5 10 15 20 25 | MARCH 5 10 15 20 25 | APRIL 5 10 15 20 25 | MAY 5 10 15 20 25 | JUNE 5 10 15 20 25 | JULY 5 10 15 20 25 | AUGUST 5 10 15 20 25 | SEPTEMBER 5 10 15 20 25

SAN BERNARDINO RAINFALL
(County Hospital)

INCHES

3
2
1
0

0.09" | 1.48" | 0.14" | 6.88" | 0.28" | 3.00" | 0.78" | 0.05" | 0.0" | 0.0" | 0.0" | 0.02"

CUBIC FEET PER SECOND

200
180
160
140
120
100
80
60
40
20
0

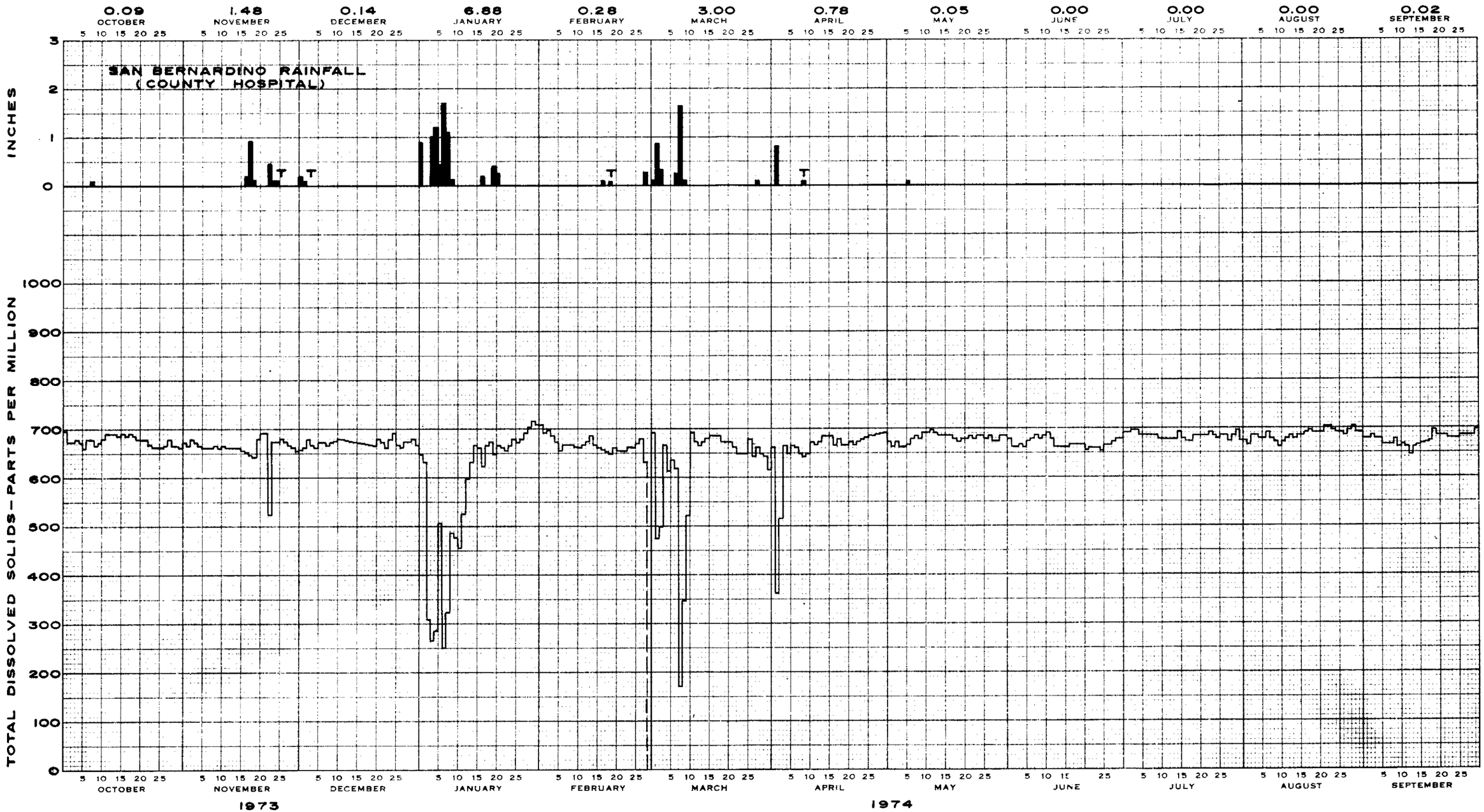
478
663
999
900
421

OCTOBER 5 10 15 20 25 | NOVEMBER 5 10 15 20 25 | DECEMBER 5 10 15 20 25 | JANUARY 5 10 15 20 25 | FEBRUARY 5 10 15 20 25 | MARCH 5 10 15 20 25 | APRIL 5 10 15 20 25 | MAY 5 10 15 20 25 | JUNE 5 10 15 20 25 | JULY 5 10 15 20 25 | AUGUST 5 10 15 20 25 | SEPTEMBER 5 10 15 20 25

DISCHARGE OF SANTA ANA RIVER AT MWD CROSSING & SAN BERNARDINO RAINFALL

(WATER YEAR 1973 - 1974)

PLATE 4



TOTAL DISSOLVED SOLID IN THE SANTA ANA RIVER AT RIVERSIDE NARROWS
UPPER FEEDER CROSSING OF M.W.D. AS DERIVED FROM
SPECIFIC CONDUCTIVITY VALUES MEASURED BY THE U.S.G.S. MONITORING STATION

PLATE 5
(WATER YEAR 1973-74)